PERCEPTIONS OF ACADEMIC LIBRARIANS' USE OF MOBILE TECHNOLOGY IN PROVIDING LIBRARY SERVICES AT UOTs IN KWAZULU-NATAL

by

Muvhulawa Romeo Matumba

Student Number: 20152912

A dissertation submitted in fulfilment of the requirement for the Master of Management Sciences in Library and Information Science degree

Faculty of Accounting and Informatics, Department of Information and Corporate Management, Postgraduate Studies, Durban University of Technology

September 2021

APPROVAL

SUPERVISOR

DR MOGIVENY RAJKOOMAR (PhD -DUT)

DOCTOR OF PHILOSOPHY: PhD: LIS, DUT

DATE: 15/03/2022

DECLARATION

I, Muvhulawa Romeo Matumba declare that this study:

PERCEPTIONS OF ACADEMIC LIBRARIANS' USE OF MOBILE TECHNOLOGY IN PROVIDING LIBRARY SERVICES AT UOTs IN KWAZULU-NATAL

is my work in both conception and execution. All sources of information used or quoted, have been duly acknowledged through complete references.

Signature: Muvhulawa Romeo Matumba

Date 12/03/2022

ACKNOWLEDGEMENTS

It is my sincere gratitude to the following individuals who have inspired this research, supported me through the process, provided such valuable information, and advised me to work hard to complete the project:

- First and foremost, I want to thank Almighty God for providing me with strength and wisdom at all times.
- I thank my family for their support during this time, particularly my wife Zama Matumba and children Zwavhudi and Rofhiwa, who allowed me to steal from our much-valued family time while embarking on this demanding task. Again, thank you for your understanding and endless support.
- Thank you to my friends, especially Joe Zondi and Patiswa Zibani, who understood the difficult circumstances I was facing during this period.
- I am grateful to my colleagues at DUT, especially Mousin Omar Saib, Nhlanhla Nhleko, Dr Patrick Mhlongo, Dr Mthokozisi Luthuli, and Dennis Mpumlwana, who ceaselessly provided me with positive feedback whenever I needed their feedback.
- Thank you to the information service librarians from both the DUT and MUT libraries, who participated in this study.
- I thank my previous Directors, Lucille Webster (DUT) and Lindiwe Ndaki (MUT), for always believing in me.
- Most importantly, my thanks go to my supervisor, Dr Mogiveny Rajkoomar, who believed in me when I almost gave up on pursuing my master's studies. I say to you: you can never retire from greatness. I will always be grateful for your endless support and dedication to my work.

DEDICATION

I wish to dedicate this dissertation to my wife Zama Matumba, my two sons Zwavhudi Romeo and Rofhiwa Matumba, my mother Elinah Musundwa Matumba, as well as everyone who has supported me. We did it!!

Allowing me to steal from our family time was not an easy thing to do. I am glad that I have made every second count.

Thank you, and may God bless you all.

ABSTRACT

Globally, libraries have begun to change how they provide services. Technology, in particular mobile technology, is one factor that is enormously contributing to how libraries are changing their ways of providing services. In higher education institutions such as academic libraries, employees are now expected to offer support and services in ways that resonate with the current generation.

This study investigates the perceptions of academic librarians on the use of mobile technology to provide library services at the UOTs in the KwaZulu-Natal province. The objectives of the study were to determine the social influences contributing to the adoption of mobile technology; the perceptions of academic librarians on the usefulness of mobile technology; the efforts required to successfully adopt mobile technology and the facilitating conditions that may be contributing to the behavioural intention to adopt mobile technology. The study objectives were aligned with the UTAUT theoretical framework and its constructs of social influence, effort expectancy, performance expectancy, and facilitating conditions. Furthermore, the study also aimed to determine if academic librarians are endorsing the adoption of mobile technology and to explore the usefulness and challenges experienced by academic librarians in the process of adopting mobile technology. The target population for this study were academic librarians employed to deliver professional services. Semi-structured interviews were used to gather data from participants.

The results point out that academic librarians are endorsing the adoption of mobile technology as a delivery model for library services. Library managers and users are encouraging librarians to adopt mobile technology. Factors such as global library trends, internal university support, and the COVID-19 pandemic have encouraged the adoption of mobile technology. Further, the study also reveals that some effort is required to successfully adopt mobile technology for library services. However, due to the challenges mentioned in the study, the majority still believe that their libraries are not ready to fully adopt mobile technology. Recommendations are made on several challenges affecting academic libraries with possible solutions to the current challenges.

KEY CONCEPTS

I. Mobile Technology

II. Library Mobile Services

III. Mobile Technology Usefulness

IV. Academic Librarians' Perceptions

V. South African Universities of Technology

ACRONYMS

4IR	• Fourth Industrial Revolution
ALA	• American Libraries Association
DUT	• Durban University of Technology
FAQs	• Frequently Asked Questions
FREC	• Faculty Research Ethics Committee
ICT	• Information Communication Technology
IRIC	• Institutional Research Innovation Committee
IST	• Information Service Team
IS	• Information Service
KZN	• KwaZulu-Natal
LIS	• Library and Information Studies
MT	• Mobile Technology
MUT	• Mangosuthu University of Technology
OPAC	• Online Public Access Catalogue

PLDUT	• Professional Librarian Durban University of Technology
PLMUT	• Professional Librarian Mangosuthu University of Technology
RSA	• Republic of South Africa
REC	• Research Ethics Committee
UNIZULU	• University of Zululand
UOTs	• Universities of Technology
UTAU	• Unified Theory of Acceptance and Use of Technology

LIST OF ANNEXURES

LIST OF FIGURES

LIST OF TABLES

TABLE OF CONTENTS

1. CHAPTER ONE: INTRODUCTION AND OVERVIEW OF THE STUDY

1.1. INTRODUCTION

Libraries have begun changing the way they provide services to their users. Mobile technology is one factor that is enormously contributing to how sectors such as academic libraries are changing ways of offering services in today's world (Kumar 2017: 103). Academic libraries are those that provide services to university and college students, faculty members and staff members, as well as their affiliated organizations.

Currently, academic libraries are now becoming digital and virtual libraries use technology to advance their services. Literature across the world is also suggesting that academic librarians need to adopt mobile technology as one of the moves towards digital platforms to remain relevant to today's users (Cao, Liang and Li 2018: 812; Gul and Bano 2019: 766). This study examined the perceptions of academic librarians on the use of mobile technology to provide library services. The researcher focused on investigating the perceptions of the academic librarian at the Universities of Technology (also known as UOTs) in the KwaZulu-Natal region.

Studies have also been conducted to establish perceptions of students in institutions of higher education on the use of mobile technology to access library services. According to the existing literature, students in universities have started requesting for libraries to provide services that can be accessed via mobile technologies such as smartphones and tablets (Xu and Du 2019: 2; Kim, Yi and Hong 2020: 2). However, very little research has been done to collect the perceptions of academic librarians, especially in the southern region of Africa, on the use of mobile technology to provide library services. The study was conducted with the hope that the various factors contributing to the adoption of mobile technology by academic librarians, as well as the different types of services offered by academic librarians accessible via mobile technologies, will be identified, together with the challenges faced by academic librarians in adopting and providing services via mobile technology at the UOTs in KwaZulu-Natal. Furthermore, the study was also conducted to determine how

academic librarians at these UOTs in KwaZulu-Natal feel about the role they are supposedly expected to play in providing library services via mobile technologies.

1.2. PRELIMINARY REVIEW OF RELATED LITERATURE

This section briefly discusses the adoption of mobile technology and their usefulness in delivering library services at the universities of technology in South Africa.

1.2.1. Adoption of mobile technologies in academic libraries

According to Acheampong and Agyemang (2021: 2), many academic libraries around the world are using mobile technologies to offer users new services and unlimited access to electronic resources.

Acheampong and Dei (2020: 2) assert that mobile technology is the most effective and fastest growing technology used by libraries around the world to deliver library mobile services. Maral and Telke (2021: 90) suggest librarians as information service ambassadors should take advantage of mobile technology in order to deliver library services. Librarians should start making their libraries mobile friendly and utilizing innovative technologies in the field of library services to avoid footfalls.

Rafique et al. (2020: 1) argues that researchers are becoming increasingly interested in mobile applications due to their proliferation and widespread use, especially in digital libraries of educational institutions. However, there is a lack of acceptance and use for mobile library applications, which leads to a need for in-depth exploration to address the reasons behind the low acceptance.

Maideen (2017: 124) echoes that, libraries today are more than just physical spaces, but spaces where people can access information resources and interact with library staff from anywhere via handheld devices. As most library users own a mobile phone, and increasing numbers of these being smart phones, it is time for libraries to take advantage of modern technology. Libraries must integrate themselves into the mobile world and keep pace with this trend if they want to provide enhanced user services to their patrons.

Blummer and Kenton (2019: 60) believes that mobile devices such as smartphones and tablets offer librarians new ways to deliver services like reference, instruction, and resources to users. As a result of the popularity of these devices on campus, academic libraries have developed mobile initiatives.

1.3. CONTEXT OF RESEARCH

The context of this research concerns issues of academic libraries using technology and in particular, mobile technology to provide services. However, the focus of the study was on the perceptions and views of academic librarians employed at the UOTs in KwaZulu-Natal of the use of mobile technology to provide library services. The researcher focused on mobile technology as it has been identified as one technology that is contributing to the change of library service delivery worldwide, including in spaces such as academic libraries (Acheampong 2019: 4; Mansouri and Asl 2019: 49). In Africa, university libraries are also starting to channel services such as OPAC/Catalogue searches, SMS alerts, PDA, information consultations, reference queries, e-Books and journal access to the digital platforms accessible via mobile devices (Mbambo-Thata 2010: 467; Ahenkorah-Marfo and Akussah 2016: 551; Ocran 2017: 15). With the fourth industrial revolution contributing to these technological changes, academic libraries are not exempted from these changes and as a result, those who are employed in academic libraries are expected to play a supporting role to effect these changes (Lippincott 2010: 206; Acheampong 2019: 3).

Finding out how academic librarians from the UOTs feel about the use of mobile technology is significant, as Aharony (2013: 365) confirms that the views can assist in identifying the current issues librarians are facing concerning providing library services via mobile technologies. Lever and Katz (2006: 1133) also indicate that collecting views of librarians might help to identify the impact of mobile technology on the professional practices of librarianship at large.

1.4. BACKGROUND OF THE STUDY

1.4.1. Durban University of Technology (DUT)

Durban University of Technology (DUT) was formed by the merger of Technikon Natal and M.L. Sultan Technikon in 2002 and was first known as the Durban Institute of Technology (DIT). Later, in 2004, the institution was converted into a University of Technology (UOT) and is now DUT (DUT 2020). This UOT enrols more than 22 000 students and employs more than 1 400 staff.

DUT has a total of 7 campuses based in the Durban and Pietermaritzburg cities, However, only 6 of the 7 campuses have libraries. The two campuses based in the Midlands in Pietermaritzburg are Riverside and Indumiso. Four other campuses based in Durban are the Steve Biko campus, M.L Sultan campus, City campus and the Brickfield campus. The DUT libraries combined have about 74 library staff members.

From the 6 libraries, only 5 libraries have employed librarians who provide professional information services. The AP library at the Steve Biko campus, BM Patel at the M.L Sultan campus, City campus library, Riverside and the Indumiso library have staff members who provide professional information services. In the South African UOTs, librarians who provide professional information services normally hold the positions of subject or faculty librarians, postgraduate or research librarians, reference librarians, and information librarians (Raju 2008: 132). These professionals are also responsible for marketing and promoting library services, providing information literacy and user education training, maintaining and developing the library collection, developing library services to fit with new and current trends, updating users with current awareness and liaising with academic departments as well as providing online reference support (Raju 2008: 124; Neerputh 2014: 95).

At DUT, the librarians who provide professional information services fall under a service unit called the Information Service team known as the IS. The IS consists of 12 subject librarians, 3 postgraduate librarians and 1 training librarian. This team is supported by 3 library site managers and 1 academic manager information services. Some of the information professional services

provided by the IS team include information literacy training, collection development, information dissemination and online information support, marketing, and training of library services and facilities, as well as online reference support. The main area of responsibility of the Information Service team is to implement policies, procedures and systems for providing and managing library information resources

The IS members provide services and support to their designated faculties, hence they also attend and report to various university faculty board meetings. DUT has a total of

6 faculties, namely, Arts and Design, Accounting and Informatics, Management Sciences, Applied Sciences, Engineering & the Built Environment, and the Health Sciences.

1.4.2. Mangosuthu University of Technology (MUT)

Mangosuthu University of Technology (MUT) was established in 1979 by Dr Mangosuthu Buthelezi and was formerly known as Mangosuthu Technikon. The former Technikon was then converted to a University of Technology in 2007 and was named the Mangosuthu University of Technology. This UOT has more than 10 000 students and employs more than 500 staff.

MUT has 2 campuses based at the Umlazi township just 15km away from Durban city. The 2 campuses are close to each other, separated by the Umlazi Mangosuthu Highway. Both campuses, the main campus, and the Natural Sciences (known previously as UniZulu) campus, have libraries and also employ academic librarians who provide professional information services. The library employs about 37 library staff (MUT 2020).

The librarians who provide professional information services at MUT fall under a service unit called User Services. The User Services consists of 3 subject librarians, 1 reference/evening librarian, 1 project librarian and the circulation coordinator. The User Services unit is supported by 1 library manager, who acts as a line manager and reports directly to the library deputy director. Some of the information professional services provided by the User Services Unit include information literacy training, collection development, information

dissemination, marketing and promoting the library to the university community, carrying out community outreach programs and online reference support.

MUT has a total of 3 faculties and these faculties are supported by the user service team. The faculties at MUT are Natural Sciences, Management, Sciences and Engineering. 6 members of the user service team are based at the main campus library and 1 user service member is based at the Natural Science campus library across the Mangosuthu Highway.

1.5. RESEARCH PROBLEM

Academic libraries exist to serve different users such as university staff (academics and admin staff), students, researchers, and external stakeholders. One of the major tasks that academic librarians are facing in today's world is coming up with services that will resonate with the different generations that universities are serving in their libraries. These generations do not have the same information-seeking behaviour, hence the library services have to resonate with each generation (Howlader and Islam 2019: 140). As confirmed by Little (2011: 267); Ocran (2017: 15); Hamidi and Chavoshi (2018: 1054) currently, academic libraries around the world are serving more young users known as Millennials, who daily execute more social and professional activities using their smartphones and other mobile devices.

Despite the mass evolving and endorsement of mobile devices and mobile technologies around the world by students, the academics including librarians have not been progressing as rapidly (Yang and Li 2015: 14; Taylor 2016: 31). According to Akeriwa, Penzhorn and Holmner (2015: 1), the implementation of mobile technology as a delivery mode of library information services is not yet a priority in most African academic libraries and it is therefore important to determine from librarians the reasons thereof. Taylor (2016: 31) also suggests that librarians as service providers should keep up with new technologies and also provide services that will resonate with their users by applying new technologies such as mobile technology, to allow users to access library services via these technologies.

The existing literature is indeed suggesting that academic librarians should be adopting mobile technology to provide and enhance their library services. Cilliers, Viljoen and Chinyamurindi (2018: 64) maintain that mobile phones, if used appropriately, can be used to address a variety of problems and challenges related to access to services due to the high usage of mobile phones and technology in South African universities. A fair amount of research across the world has been done to determine the students' perceptions on the adoption of mobile technology in providing library services in special, public and academic libraries. However, little research exists that talks to the perceptions and responses of academic librarians to the use of mobile technology to provide services in the South African UOTs.

1.6. AIM OF THE STUDY

The main aim of this research is to investigate the perceptions of academic librarians in the Universities of technology (UOTs) in KwaZulu-Natal on the use of mobile technology in providing library services.

1.7. OBJECTIVES OF THE STUDY

The objectives of the study were as follows:

- To determine the social influence aspects such as peer effect and users' influence on the behavioural intention to adopt mobile technology as a delivery model for library services by academic librarians in the UOTs in KwaZulu-Natal.
- To determine the perceptions of the academic librarians at the UOTs in KwaZulu-Natal on the usefulness of mobile technology as a delivery model for library services.
- To determine the perceptions of academic librarians at the UOTs in KwaZulu-Natal on the efforts required to successfully adopt mobile technology as a delivery model for library services.

- To determine the facilitating conditions that might be contributing to behavioural intensions for academic librarians at the UOTs in KwaZulu-Natal to adopt mobile technology to provide library services.

1.8. CRITICAL QUESTIONS

The study seeks to provide answers to the following questions:

1) Are there social influences contributing to the behavioural intentions to adopt mobile technology by academic librarians at the UOTs in KwaZulu-Natal?
2) What are the perceptions of academic librarians at the UOTs in KwaZulu-Natal on the usefulness of mobile technology as a delivery model for library services?
3) What are the perceptions of academic librarians at the UOTs in KwaZulu-Natal on the efforts required to successfully adopt and use mobile technology as a delivery model for library services?
4) Are there any facilitating conditions contributing to the adoption of mobile technology by academic librarians at the UOTs in KwaZulu-Natal?

1.9. RATIONALE AND SIGNIFICANCE OF THE STUDY

Studies such as that of Corrall (2015: 227); Lucas (2020: 8); Nakitare *et al.* (2020: 340) suggest that academic librarians in today's world need to possess extra skills that will allow them to work in a digital world and to be able to use new technologies to provide services. Hence, it was vital for this research to be conducted to determine the various factors contributing to the adoption of mobile technology, and to understand how academic librarians in the UOTs feel about the adoption of mobile technology as a delivery model for library services. It is hoped that the findings of this research will help to make academic librarians identify their weaknesses, challenges, and their strengths regarding the use of mobile technologies to provide library services in their respective libraries. The different perspectives held by academic librarians at UOTs in KZN might help other academic librarians to identify personal gaps such as the need for new skills and knowledge, training needs and other areas of improvement

in their field. The knowledge collected from this research might assist not only academic librarians, but also other institutions of higher learning, in identifying various ways of embracing and adopting mobile technologies to serve todays' users.

1.10. RESEARCH DESIGN AND METHODOLOGY

A qualitative approach was used to collect and analyse qualitative data from the participants in order to generalise findings. In the process, a purposive sampling approach was adopted to ensure relevant and reliable data from participants who were responsible for providing information services to their respective library users at the OUTs in KwaZulu-Natal. The interview schedule was pre-tested to determine its reliability and validity. The 11 participants were interviewed via the MS Teams platform using a semi-structured interview schedule. In this study, data were then analysed using NVIVO software to generate themes as thematic analysis was also utilised.

1.11. SCOPE AND LIMITATIONS OF THE STUDY

This research focused on the academic librarians directly involved in marketing, promoting, and training library resources, services, and facilities at the UOTs in KwaZulu-Natal. The researcher focussed on UOTs, as currently, UOTs are using their technological strength as one of the main strategic points to market themselves as institutions which use technology to enhance research, teaching and learning to potential students and staff (Rambe 2016: 86).

1.12. DEFINITION OF KEY TERMS

1.12.1. Academic Library

A Library that is attached to an institution of higher education such as a college or a university and exists to serve the university or college stakeholders' such as students and staff (ALA 2021: para.1 line 1).

1.12.2. Academic Librarians

Academic librarians are library staff members employed at university or college libraries who are accountable for obtaining, systematising, managing, and disseminating library resources and also ensuring that library services meet the needs of its users (Mabweazara 2018: 73).

1.12.3. Fourth Industrial Revolution (4IR)

The Introduction of massive automation and artificial intelligence and the decline of industrial jobs (Peters 2017: 3).

1.12.4. Information Literacy

American Libraries Association (ALA) 2016 as cited in Mann (2019: 83). defines information literacy as the ability to identify when there is a need for information, understand where and how to find such information, and be able to evaluate and use the information effectively and ethically.

1.12.5 Library Services

This refers to the services such as library catalogue/OPAC, access to e-books, e- journals, e-newspapers, book loans and renewals, information service consultations or subject librarians' consultations, past exam papers access, mobile printing and scanning, study group rooms, research guides, awareness services, SMS communication, access to information literacy training, guides, videos, presentations and tutorials (Matthews 2017: 116; Cristobal 2018: 1).

1.12.6 Mobile Technology

Mobile devices are cell phones, laptops, notebooks, netbook computers, audio mp3, cameras, iPads, and other devices that can be used to access the internet, messages, and email as well as offer other tools to create digital content and other technological activities (Lippincott 2010: 210).

1.12.7 University of Technology

"A University of Technology offers technological career directed educational programmes, focuses on innovative problem-solving research, and engages

with government/business/industry communities as end-users" (CET 2020: para.5 line 1).

1.12.8 Virtual/digital Libraries

This is a library with no physical wall or building exists to serve users via an electronic platform. These types of libraries are also known as digital libraries (Li *et al.* 2019: 22; Ubogu 2021: 134).

1.13. STRUCTURE OF THE DISSERTATION

Chapter 1: Introduction and Background of the study

Chapter one of this dissertation provides a detailed introduction, context of the research, background of the study, research problem, purpose of the study, objectives of the study, critical questions, rationale for the study and the significance of the study, the scope and limitations of the study, definition of key terms, and the structure of the dissertation.

Chapter 2: Literature Review and Theoretical Framework

This chapter starts with a detailed discussion on the chosen theoretical framework, UTAUT. The UTAUT constructs are also highlighted with discussions on how each construct align with the objectives of the study. Following the theoretical framework are discussions of literature related to the study as follows: history of mobile technology in libraries; academic librarians and mobile technology; the impact of mobile technology in academic libraries; mobile technology challenges; and mobile devices usage at universities and the changing role of academic librarians.

Chapter 3: Research Design and Methodology

This chapter provides a description of the research design, population, ethical considerations, confidentiality and anonymity, data collection, validity and reliability, delimitation, limitations of the study, and data analysis technique.

Chapter 4: Data Presentation and Analysis

This chapter discusses in detail the data analysis, presentation of the interview data, achievement of the study objectives, and how the critical questions were answered by the study.

Chapter 5:Key Findings

This chapter summarises the study's main findings based on the purpose, aim and objectives of the study.

Chapter 6: Conclusions, Recommendation and Contributions of the Study

The chapter begins by restating the problem and drawing conclusions based on the study's objectives. An overview conclusion is presented. This chapter concludes with recommendations and explains the study's relevance.

1.14. CHAPTER SUMMARY

The introductory chapter aimed to provide a general overview of the study. This emphasised both the importance and the relevance of the study. It was critical to indicate how the study would contribute to the body of knowledge by filling the gaps identified in the literature. An analysis of the research problem was given in Chapter One, along with the objectives of the study. The study explained key concepts related to the phenomenon based on their importance. The chapter also provided the background of the institution's studies, critical questions and the definitions of key terms in the study. The next chapter will provide details of the theoretical framework used to guide the study as well as the various literature related to the undertaken study.

2. CHAPTER TWO: LITERATURE RIVIEW AND THEORETICAL FRAMEWORK

2.1. INTRODUCTION

A literature review provides an opportunity for the researcher to highlight the link or the relations between various sources of information related to the undertaken research. It is a process that allows the researcher to display the identified theories and previous research, which played a role in influencing the researcher to choose and adopt a particular research methodology (Palmatier, Houston and Hulland 2018: 4; Fink 2020: 6). The literature review process assists in identifying new ideas that require development. It also helps researchers to understand further the field of research and identify authoritative sources specialising in the field of the researcher's choice (Machi and McEvoy 2016: 3).

A literature review is a process that helps researchers to connect their research ideas with existing literature as well as identify research gaps. One of the reasons why the researcher embarked on this research was the existing literature suggesting that academic librarians should be using mobile technology to provide services in their libraries. All research needs to be informed by existing knowledge in the field of study; hence, the researcher also consulted relevant literature to assist in developing this research. A literature review can also assist researchers to build ideas that could be of benefit to the field (Hart 2018: 3).

The literature consulted by the researcher encompasses aspects such as mobile technology in academic libraries, academic librarians and mobile technology, the history of mobile technology, mobile technology challenges, mobile device usage at universities, and the changing role of academic librarians. This chapter provides detailed information about existing literature related to these aspects, as well as a discussion on how the theoretical framework chosen for the study was used to guide the researcher.

2.2. THEORETICAL FRAMEWORK

Many frameworks can be associated with this research. Various theoretical models such as the Social Cognitive Theory (SCT), the Technology-Organization- Environment framework (TOE), the Motivational and Self-Determination Theory (MSDT), the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), have been used to analyse the adoption of mobile application and other Information Communication Technologies (ICTs). However, the UTAUT has been identified and considered as the best model with much better analytical capacity than the other models (Palau-Saumell *et al.* 2019: 2). The Unified Theory of Acceptance and Use of Technology (UTAUT) was applied to underpin this research. Oye, Iahad and Rahim (2014: 107); Williams, Rana and Dwivedi (2015: 444) define the UTAUT as a framework that can be used to guide those who are researching the behavioural intention, adoption, acceptance and usage of ICT and technology in general for teaching, research and learning. Mukred *et al.* (2019: 35693) concur that the UTAUT framework is more relevant and reliable to researchers who wish to examine behavioural intentions, acceptance and use of a new system or technology.

2.2.1. UTAUT constructs

According to Wong (2015: 2), the UTAUT is considered the best model to analyse the adoption of mobile application and Information Communication Technology (ICT), as it also comprises elements from the following theories:

- Social Cognitive Theory (SCT)
- Innovation Diffusion Theory
- Blended Theory of Planned Behaviour
- The Theory of Reasoned Action (TRA)
- The Model of PC Utilization
- The Technology Acceptance Model (TAM)
- The Motivational Model (MM)

- Theory of Planned Behaviour (TPB)

The concepts investigated by the current research are covered by most of the eight listed models; hence, it is practical to adopt the UTAUT model because it includes all the mentioned aspects. “UTAUT is based on the information that people would have a more positive attitude while using a system which satisfies their performance expectancy as well as their expectancies about their efforts and facilitates their work conditions with social support” (Donmez-Turan 2019: 1383). This statement supports the idea of using the UTAUT model in research that looks at the attitude of people toward the introduced technology within an organisation; this contributed to the researcher choosing this model as an appropriate one for the current research.

Hsu (2012: 45) confirms that the UTAUT model holds four key constructs: the social influence, effort expectancy, performance expectancy and the facilitating conditions. Performance expectancy, social influence and effort expectancy are the three constructs suggested by the UTAUT theory as being the direct determinant of a user’s intention to adopt technology and the user’s behaviour towards the adoption of technology (Ahmed *et al.* 2017).

2.2.1.1. Social influence

Nysveen *et al.* (2016: 295) indicate that social influence can be defined as the degree to which the studied population is convinced or encouraged by others to use technology. In this case, one of the objectives of the study was to determine how other colleagues and the library users such as students and staff, contributed to making academic librarians consider adopting mobile technology as a delivery model for library services. Rempel and Mellinger (2015: 45) also suggested that the UTAUT model is very useful for research that includes an investigation into how people influence the adoption of technology by others. The current study also investigated the possibility of the library user’s influence that could have contributed to the academic librarians’ adoption of mobile technology in providing library services.

2.2.1.2. Effort expectancy

Dwivedi *et al.* (2019: 723) suggest that effort expectancy deals with the degree of ease concerning the use of technology by the studied population. This reflects on the importance of the user-friendliness of the technology, which would then play a role in determining the intention to use the technology. Morales and Trinidad (2019: 4) indicate that effort expectancy also deals with analysing the number of efforts required to use or adopt a technology. One of the study's objectives was to examine how academic librarians perceive the efforts needed to adopt mobile technology. Specific questions were designed to collect data in this regard. Some of the questions focussed whether librarians were finding it easy to understand, use, and market mobile-based services, as well as how much knowledge librarians had regarding what mobile technologies can do for libraries.

2.2.1.3. Performance expectancy

According to Bhatiasevi (2016: 801), performance expectancy is regarded as the strongest construct that can assist in identifying and analysing the attitude toward the use and behavioural intention of the targeted population to use technology. This construct deals with determining the perceived benefits if the technology is adopted (Jacob and Pattusamy 2020: 37). The study's second objective was to determine the perceptions of academic librarians about the usefulness of mobile technology for delivering library services. In the interview schedule, librarians were asked whether mobile technology makes their jobs easier and if users are using mobile technology to access library resources efficiently. The study's objective and questions aligned with this construct, as described above.

2.2.1.4. Facilitating conditions

Facilitating conditions can be defined as the user’s views on the availability of resources for assistance and organisational assistance and interventions aimed at assisting the user. The facilitating conditions such as the availability of user guides, IT support and organisational culture support, are believed to have a direct and positive influence on the use of technology (Khechine, Raymond

and Augier 2020: 2). In a study by Chang (2013: 479), it is suggested that the facilitation condition, which is one of the UTAUT constructs, plays a significant role in influencing how information technology is used and adopted.

Alajmi and Alotaibi (2020: 157) also concur that as a construct, facilitating conditions refers to the extent to which a person perceives that there is an organizational and technical infrastructure that supports the use of the system. The last objective of this study was to determine the enabling conditions that might be contributing to academic librarians at UOTs in KwaZulu- Natal adopting mobile technology in their library services. As part of achieving this objective, questions were formulated to assess if there are reasons or activities that encourage librarians and their libraries to adopt mobile technology for services. Furthermore, participants were asked to describe what kinds of support their library or institution provides to promote the adoption of mobile technology and if there are any barriers to mobile technology adoption in their respective institutions.

2.3. LITERATURE REVIEW

2.3.1. History of mobile technology in libraries

The development and growth of Information Communication Technology over the past20 years have hugely impacted academic libraries on how they offer services (Upadhyay 2015: 75). The history of mobile technology in libraries is very vague, as various sources point to different years for different milestones. Dresselhaus and Shrode (2012: 83), argue that libraries started moving toward mobile technology around the 1990s, when libraries in America used mobile technology for their users to search and read electronic text on what use to be called PDAs (Personal Digital Assistance). Bolton-Palumbo (2014: 183) argues that most of the libraries worldwide started using mobile technology effectively in the mid-2000. Library users were able to use mobile phones to download audiobooks, search the library catalogue and receiving text notifications about the library's operation times and book loan notifications.

Academic libraries in African universities started moving towards adopting mobile devices in the mid-2000. As early as 2006, students in some academic

libraries in Nigeria and Tanzania were already using mobile devices to access and search the library catalogue, receiving IN FULL (SMS) from libraries about book loans, sharing tutorial dates and venue details (Ocran 2017: 11).

A study conducted by Mpofu (2016: 928) indicates that previously, libraries depended largely on big buildings for space, and that due to the lack of resources and funding in higher education, librarians are forced to move towards mobile technology. Today, gadgets such as e-book readers, smartphones, tablets, and other mobile devices have become essential tools of libraries, as they are part of the future of information retrieval used by many students in universities. The need for academic libraries to move towards using modern technology to provide services was also part of the libraries' conversation in early 2000. Hisle (2002: para. 7 line 2) hinted in the early 2000s that the future of academic libraries should also focus on investing in services that fit well with modern users and that such services should be accessed from anywhere. However, in 2015, Akeriwa, Penzhorn and Holmner (2015: 285) stated that "there is an undisputed need for libraries in developing countries to be on the same level with technological advances as the rest of the library world. However, the implementation of social media and the use of mobile communication for service delivery are trends that are yet to be fully embraced by academic libraries in sub-Saharan Africa and other places in the developing world". The author used this statement to argue that the conversation about using mobile devices to access library services has been there. However, academic libraries, especially in African universities, have not yet reached the stage where mobile technology is used effectively to enhance library services.

After the year 2010, libraries in China, including academic libraries, started using a mobile App called WeChat to disseminate and engage with students. WeChat was used to share new services, videos and tutorials, live chat with librarians, video calls, and many other services. Users could follow the library account to access and enjoy the benefits and this was most appreciated by students (Xu *et al.* 2015: 22).

Between 2013 and 2015, IT organisations and libraries in the UK started putting together a working group to discuss more collaborative approaches to service

delivery in the new century. A working group called “libraries of the future” was established to investigate the ways of providing smart and quick services using new technology. Mobile technology was one of the major technologies described as the disruptive innovation technology that librarians should embrace and use to benefit users (Tait, Martzoukou and Reid 2016: 2).

2.3.2. Academic librarians and mobile technology

In the 90s, Rice-Lively and Racine (1997: 31) hinted that the function of the librarian seemed to be evolving from the keeper of the books to that of Network Navigator. Maideen (2017: 124) and Hamad, Farajat and Hamarsha (2018: 438) confirm that in today's world, mobile technology is seen as providing an opportunity for academic librarians to distribute their services to the university community without getting everyone to physically visit the libraries. Saragossi, Costello and Kasten (2018: 200) state that traditional libraries are changing to become digital and virtual libraries and that librarians have to adjust to these technologies as they have to provide services using new formulas and methods required by today’s generation.

The results of a study by Wang *et al.* (2016: 666) shows that students in academic institutions have the highest level of mobile technology adoption and are very eager to use their smartphones and devices for academic work and research. Johnson (2019: 39) suggests that academic librarians need to start using mobile technology to enhance and provide quick and easily accessible services to today’s users. Abdekhoda, Gholami and Zarea (2018: 275) also stress that librarians should take time to learn and understand the different types of technologies and services that are accessible via mobile technology.

New technologies are constantly evolving, and librarians must ensure they are prepared to develop, implement, and evaluate rapid changes that could lead to better services for users. In addition to this, librarians must be able to assess technology trends and directions holistically and concomitantly respond to evolving user needs. Using a model like UTAUT can assist librarians in determining how mobile devices are adopted in their libraries (Andrews, Ward and Yoon 2021: 2).

Research conducted at the academic libraries in Malawi suggests that university students in African universities are very positive and looking forward to library services accessible via mobile technology. However, there is a need for studies to be conducted to find out from librarians if they are in favour of using mobile technology to provide library services (Chaputula and Mutula 2018: 282). Research conducted by King (2018: 9) suggests that academic librarians in African universities and colleges should learn more and stay alert about these new technologies. It is alleged that library users stand to gain more when librarians are well aware of the new trends and technologies such as mobile technology. Mobile technologies can assist academic libraries in improving and fast-tracking access to information and resources from any smart device anywhere, hence academic librarians are expected to provide services using mobile technologies in today's world. The use of advanced mobile technology in libraries can improve communication between librarians and their users; however, institutions have to manage and regulate how mobile technology can be used within their institutions.

Academic librarians should not only look at using mobile technology for the sake of using new technology, but rather to provide solutions to challenges faced by users while accessing library services. The use of mobile technology should go beyond just providing trending technology but using technology that provides solutions to today's problems for today's users (Enakrire and Ocholla 2017: 1; Kraft 2018: 4). According to Ihejrika, Goulding and Calvert (2021: 64), university libraries in Europe and America have adopted mobile technology to advance their services, maximise their exposure, improve and modernise the image and online reputation, promote specific library content to reach a wider University community, as well as to stimulate discussions and online collaborations. The current study explored the understanding of mobile technology by academic librarians, and how academic librarians are using mobile technology, as well the reasons and purposes for mobile adoptions in the UOTs in KZN.

2.3.3. The impact of mobile technology in academic libraries

Libraries have changed from using their traditional ways to deliver services and are now making use of digital spaces as part of library service delivery. The move has been seen as a way to fit in with the digital times (Bansode and Shinde 2019: 279). “Mobile devices lead to new forms of engagement with student learning; so academic libraries are expected to be strong partners in the teaching and learning processes of their institution” (Kubat 2017: 120). This statement can be used as confirmation that academic librarians are expected to provide library services using mobile technologies to reach the wider university community, as well as to remain relevant. Yoon (2016: 687) confirms that academic libraries have started using mobile applications to allow users to access essential services such as searching the library catalogue, viewing library events, receiving messages and notifications. Some of the services accessible via mobile technology offered by libraries to strengthen relationships include the OPAC searches, access to electronic resources, library chat facilities, and library online surveys and polls that are accessible from anywhere via mobile devices (Abata-Ebire *et al.* 2019: 7).

As much as studies such as those of Canuel and Crichton (2017: 5); Chaputula and Mutula (2018: 277) suggest that students are capable of accessing library services via mobile technology, Dold (2016: 680) argues that academic libraries will need to make instructions on how students can use mobile technology for academic learning. A study conducted by Dold (2016: 681) found that students were using their mobile devices and smartphones to access academic work. However, students were battling to use their mobile devices to access and conduct library research work. Students are now recognising mobile technology as a medium that can assist libraries to strengthen relationships with users, especially those accessing the library remotely. According to Elahi, Islam and Begum (2018: 38), as the world is becoming a global village, the use of mobile devices to communicate and access information has become an essential part of any organization’s success. People are now willing to use advanced technology such as mobile technology in their daily lives; thus, it has become vital for institutions such as libraries to adopt mobile technology in providing services.

According to Liu and Briggs (2015: 134), common mobile services offered by most academic libraries are mobile-friendly access to the library's catalogue, information literacy services, e-books and e-journal user-friendly access, and library surveys using QR codes on mobile devices. Some academic libraries are now using mobile devices to promote library services via social media services. This has been done to promote real-time and live communications with users on and off campuses, without physically communicating with users. It is also confirmed that academic libraries are using mobile devices to promote their digital resources which are now used more than before (Xu *et al.* 2015: 22). Margam and Dar (2017: 110); Mansouri and Asl (2019: 50) indicate that academic libraries are also providing services such as ask- a-librarian, current awareness, renewal requests, due day reminders, and overdue notification services. These services are provided to keep up with the current trends and to stay relevant to the current user.

Academic libraries are confronted with new challenges such as the change of delivering higher education instructions, the new type of students in higher education systems, and the increase in the use of open access and educational platforms that currently exist. Mobile technology has been seen as a solution to the mentioned challenges and academic libraries should be taking these as opportunities rather than challenges (Saunders 2015: 286). Ball (2019: 4) argues that due to the increasing growth and usage of mobile technology, academic libraries will no longer be focusing on open source soon but rather on open data, if not open science. In addition, academic libraries are now required to demonstrate their value within their institutions and mobile technology provides that opportunity to display the value through mobile technology. This shows the significance of mobile technology has for academic libraries and their future in the dissemination and delivery of services. Through determining the various social aspects, facilitating condition, performance expectancy, and effort expectancy, the current study explored how mobile technology is influencing the change in service delivery by academic libraries in the UOTs in KZN.

2.3.4. Mobile technology challenges

Guiding students to use these mobile technologies is one of the main challenges faced by teaching and learning departments, including libraries that are embarking on using mobile technologies. Furthermore, the lack of training and proper awareness activities on the use of mobile devices continues to create barriers in using mobile technologies in many libraries (Al-Daihani *et al.* 2018: 332). The small and inadequate budget has also been identified as a potential barrier for academic libraries to adopt new information communication technology such as mobile technology, in some institutions (Tait, Martzoukou and Reid 2016: 3).

Mobile technology has provided more benefits than disadvantages. However, Ngesi *et al. (*2018: 2) argue that mobile technology has been seen as a disruptive technology in both the basic and higher education sectors. In some institutions, students have been disrupting classes by using cell phones to chat and send messages during classes and these have disrupted many institutions. As a result, some institutions have banned the use of cell phones in class due to radical disruptions experienced by teachers and lecturers. Ngesi *et al.* (2018: 2); Ruxwana and Msibi (2018: 2) confirm that the South African youth in universities have access to smartphones and tablets and this allows for universities to introduce the concept *Bring Your Own Device* (BYOD). However, concepts such as BYOD may be disadvantaging students who come from disadvantaged backgrounds and the main benefactor could be those who are better off. This, in return, may contribute to inequality in education. Dania *et al.* (2016: 32) confirm that since the acceptance of mobile devices and the inception of BYOD to be used as part of learning, most students are still using their mobile devices for social activities even during learning time. Students are now spending more time on social activities than on their academic work. In some cases, students stopped using the library and started using sources such as Wikipedia as a main source to complete academic research and projects.

A study conducted by Abbas, MacFarlane and Robinson (2017: 184) revealed that when students did use their mobile devices to access legal information via library platforms, poor usability and limited functionality were some of the

concerns raised by students. Law librarians who were also interviewed indicated that mobile devices were best suited for short readings. The study also reveals that students requested that librarians should provide faster library smartphone apps with fewer distractions and no pop-ups as they contribute to more distractions. Owusu-Acheaw and Larson (2015: 94) recommend that academics should collaborate with librarians to work toward encouraging students to limit the time spent on social media sites. Librarians can assist in encouraging students to spend less time on social sites per day and to spend more time on their devices accessing reliable and relevant academic resources and reading novels. This shows that academics need librarians in the fight against the use of irrelevant and unreliable sources.

The study also shows that the use of social sites had affected the academic work of students in a negative way, hence the librarians were needed to help change the situation at some universities in Ghana. Hanbidge *et al.* (2015: 110) indicate that because of students not utilising academic resources using their mobile devices, academics found it necessary to collaborate with librarians at some of the university campuses in Canada. A Mobile information literacy (MIL) program was designed to encourage students to use their mobile devices for academic purposes. Renison University College embarked on the MIL program to contribute to the positive practices that universities can use while adopting mobile technology for research and learning. The findings by Hanbidge *et al.* (2015: 113) suggested that mobile information literacy programs should be ongoing and incorporated into the students' academic curriculum to avoid students disregarding the program, if not part of the curriculum.

Mobile technology is now considered essential in distributing and sharing information. However, Kim (2017: 72) argues that mobile technology also contributes to the ever- increasing sharing and distribution of fake news. Students at universities are now sharing more information without taking the time to verify if the information is true or not. Due to the overwhelming use of mobile technology used for various purposes in academic institutions back in 2013, Dewa and Mutula (2013: 154) suggest that institutions should consider developing policies that would serve as a guideline on the usage of mobile technology in academic libraries. A study at the University of Zimbabwe found

that there was considerable inappropriate use of mobile technology by students during classes. The misuse of mobile devices included students trying to access explicit websites, staying on chat sites, and having cell phone rings during learning time. The university did not have any guidelines or policy on how, what, where, and when these mobile devices should be used, so there were many disruptions and misuse of the devices even during academic sessions. The study suggested that libraries and institutions, in general, should develop mobile phone policies and guidelines to help manage and regulate the usage of mobile devices at the institutions.

"*The classroom student's learning is highly affected by the use of personal devices by other students causing disruptions during class time with cell phones ringing, text messaging, receiving and sending e-mails, as well as using social media sites such as Twitter, Face book, and LinkedIn*" (Kim 2017: 74). Due to these kinds of disruptions, academics are forced to make decisions on whether to allow students to use mobile devices in class even though the world has moved towards using mobile technology for learning. It is becoming vital and empirical that institutions of higher learning should create policies and guidelines that may be used to regulate and provide guidance on the use of mobile technology for learning (Mirembe, Lubega and Kibukamusoke 2019: 73). The current study also aimed at exploring various challenges faced by academic librarians in providing library services that are accessible via mobile technologies.

2.3.5. Mobile device usage at universities

Bagui and Mwapwele (2019: 83) hint that due to the usage of mobile devices to access learning materials and accessing online learning classes, there is a possibility of face-to-face classes fading sooner. The emergence of Massive Open Online Courses (MOOCs) and the freely accessible Open Educational Resources (OERs) are also contributing to the high usage of mobile devices by students at universities worldwide.

In South African and Australian universities and colleges, students have adopted mobile technology. Students are now using their smartphones and tablets to apply for jobs using online platforms as well as to communicate daily.

Over 80% of students in Australia bring laptops and smartphones to class for learning purposes (Roberts and Rees 2014: 415; Shava and Chinyamurindi 2018: 2). According to Saavedra (2018: 73) students in the New Zealand universities uses mobile devices to access learning material, maintain social connections and manage workflows. Some of the social factors contributing to such usage include lecturer's influence, task completion, pedagogical approaches and social influences. Saavedra also reiterates: "*The increase in mobile devices can be seen to have facilitated the increase in a more flexible approach to teaching and learning*". Mobile technology is in many ways contributing to the change of academic learning delivery in institutions of higher learning.

De Kock and Futcher (2016: 27) argue that universities in South Africa are warming to the concept of Bring Your Own Device (BYOD) and are encouraging students and staff to use mobile technology as part of students teaching, learning and research. However, challenges such as cybersecurity and cyberbullying are also starting to develop more amongst students in universities, due to the high usage of mobile technology by students. Some universities are using mobile learning applications as a way to measure their students' readiness towards mobile technology. As a result, mobile devices are used as blended learning tools to complete formal and informal assessments. Mobile learning provides students with instant access to earning resources from anywhere. Students can complete assessments and submit assignments and projects without face-to-face sessions with instructors (Delcker, Ifenthaler and Honal 2016: 60). The current updated national policy for libraries in South Africa is also advocating for libraries to move towards designing information literacy programs such as digital literacy, web literacy, traditional information literacy that can be offered via mobile technologies and not only in physical spaces (NLSA 2018: 36).

Almaiah, Alamri and Al-Rahmi (2019: 174674) argue that it is vital for institutions to conduct surveys to find out from students about the acceptance of the mobile learning application. Failure to use or acceptance by students to utilise these new developments will lead to either success or failure of mobile technology effectiveness towards learning. Therefore, institutions are

encouraged to conduct surveys to determine the students' acceptance of these mobile learning applications. The current study looks at finding out the type of users who are requesting services that are accessible via mobile technology as well as the type of services that academic librarians are proving via mobile devices. Furthermore, the current study also aims at finding out from academic librarians if their libraries have conducted surveys to find out if users (specifically students), have access to devices with the capability to access library services provided by the library.

2.3.6. The changing role of academic librarians

Pospelova, Tsurtsumia and Tsibulnikova (2018: 654) confirm that the role of an academic librarian is changing, as in the past, librarians mainly focussed on the products of scholarship. Today, their focus is on understanding and examining the process of scholarship. Librarians in academic institutions are now valued and seen as strategic partners whose new roles are linked to the institution's mission. They are now recognised as staff who contribute to strengthening the university's ability to influence research and to the institution's global repute (Nitecki and Davis 2017: 9). Some of the new roles today include academic librarians as the liaison for faculties and departments within the institution as well as playing a role as embedded librarians The benefits of being knowledgeable, self-confident, hands-on, and technologically savvy enable academic librarians to be successful in these new roles. Pospelova, Tsurtsumia and Tsibulnikova (2018: 653) concur with Chanetsa and Ngulube (2016:152) that academic librarians no longer just provide support for faculties and departments, but rather act more like partners and leaders, helping faculty and students navigate a rapidly changing landscape that requires continuous support.

Academic librarians play specific roles to library users and with technology changing how business and information services are rendered, academic librarians' roles are also changing. At first, technology was seen as a disruption of the traditional ways of providing services in libraries including academic librarianship. Today, librarians, including academic librarians, are seeing technology as a positive game-changer in the librarianships field (Tait,

Martzoukou and Reid 2016: 3). Librarians' evolving roles, as mentioned above, can be regarded as facilitating conditions that contribute to the adoption of mobile technologies in academic libraries around the world.

Shonhe and Jain (2017: 2); Acheampong (2019: 21) concur that, aspects such as mobile technology are contributing to how the role of academic librarians is changing in today's world. Librarians are now channelling their services via mobile technology, which is a role that did not exist in the past. Mobile technology is affecting how academic librarians conduct information dissemination. Academic librarians as advocates and leaders in the information world also purchase mobile applications to use as agents of information to support today's users. Morgan, Gipson and Robinson (2019: 79) argue that as a way of reducing costs in academic libraries, librarians are now expected to consider building mobile applications from scratch with the assistance of IT consultants. The current study also looked at how mobile technology is contributing to the changing role of academic librarians in the UOTs in KwaZulu-Natal, South Africa.

2.4. CHAPTER SUMMARY

This chapter discussed various local African and global literature that talks about the use of mobile technology by academic librarians. With libraries moving towards digital and virtual libraries, literature on the challenges and issues affecting academic libraries and librarians in using mobile technology was discussed to highlight how these pieces of literature support the study embarked by the researcher. This chapter also provided a brief history of how, when and why libraries started using mobile technology globally and in African universities. The literature explored in this chapter also assisted in confirming that mobile technology is indeed an appropriate tool that can play a role in providing library services for the current library user. The UTAUT theoretical framework was discussed as the framework associated with the study. Furthermore, the four UTAUT constructs were also discussed in detail, with indications of how each concept fits with the objectives of the student. The used framework supports and guides the research conducted to investigate the behavioural intentions, adoption, and acceptance of Information

Communication Technology (ICT) such as mobile technology. This chapter also discussed the literature showing examples of

how other academic libraries and librarians are using mobile technology to enhance their services to benefit users.

3. CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1. INTRODUCTION

In this chapter, the researcher elaborates on the methodology used in the study. The chapter discusses the research design, population and sampling, ethical considerations, study limitations and delimitations, data collection and data analyses used. The researcher highlights the justification of the design, methodology and other choices undertaken in the study to satisfy the requirements of the research objectives and to address the research problem. The researcher chose the method, design, and tools that were deemed appropriate to ensure that the research questions of the study were answered. The four research questions of the study, as indicated in Chapter One, were as follows:

Are there social influences contributing to the behavioural intentions to adopt mobile technology by academic librarians at the UOTs in KwaZulu- Natal?

What are the perceptions of academic librarians at the UOTs in KwaZulu- Natal on the usefulness of mobile technology as a delivery model for library services?

What are the perceptions of academic librarians at the UOTs in KwaZulu- Natal on the efforts required to successfully adopt and use mobile technology as a delivery model for library services?

Are there any facilitating conditions contributing to the adoption of mobile technology by academic librarians at the UOTs in KwaZulu-Natal?

Details are also provided in this chapter on how themes were identified using the NVIVO application, to make sense of the qualitative data collected.

3.2. RESEARCH DESIGN

Gill (2020: 4) and Anderson (2017: 1) identified several varieties within qualitative research: biographical, phenomenology, grounded theory, ethnography, case studies, and narrated participant action. Authors (Al-Ababneh 2020: 77; Alharahsheh and Pius 2020b: 42) confirm that the

qualitative approach is linked to a type of phenomenology or paradigm referred to as interpretivism. Interpretivism allows for research areas such as cross-cultural differences, issues of ethics as well as individual views and opinions to be collected (Dudovskiy 2019: 1). This study followed a qualitative approach. The study collected the academic librarians' perspectives about the use of mobile technology in providing library services; hence, interpretivist phenomenology was followed. According to Makombe (2017: 3370), qualitative research is interpretive and phenomenology allows interpretivism research data collection and analysis to occur at the same time. Furthermore, Interpretivism aims to include the richness of the insights gathered by researchers and for the researcher to explore deeply these insights from research participants (Alharahsheh and Pius 2020a: 41).

Table 3.1: Summary of the research method, design and tools used in the study.

Research design	Interpretivism
Research method	Qualitative
Nature of knowledge	Subjective
Data collection tools	Interview (semi-structured)
Data analysis	Thematic descriptive codes and actual responses

Table 3.1 provides a summary of the research paradigm, nature of knowledge, method design tools, and the approach to data analysis.

3.3. RESEARCH METHOD

Roller (2019: 1) and Jamali (2018: 201) confirm that researchers use a qualitative or quantitative approach, or even both, known as a mixed methods approach, when investigating or conducting research. This study employed a qualitative approach. Rallis and Rossman (2017: 4) suggest that qualitative research is a method whereby the researcher investigates and systematically gathers information about a certain phenomenon to get the personal views of

those involved in the process. This methodology was found to be more appropriate for the study because it allowed the researcher to collect the views of individuals about a particular issue. The researchers employed interpretative investigation to understand the matter being studied in the process also creating knowledge and understanding of how best to meet the research goals and objectives and practical considerations, such as scheduling appointments with the targeted academic professional librarians experiencing the situation. In this case, the study concentrated on finding out the perceptions of librarians on the use of mobile technology to deliver library services. Semi-structured questions were used as a data collection tool for this study. Interviews with semi-structured questions are effective for researchers who need to collect qualitative, open-ended data, to dig deeper into a topic's scope, thoughts, feelings, and beliefs (DeJonckheere and Vaughn 2019: 4; Mahat-Shamir, Neimeyer and Pitcho-Prelorentzos 2021: 83).

3.4. POPULATION

The population refers to the total number of humans or objects available to be included in a study or enquiry (Dorling 2020: 65). This study was conducted at two UOTs in KwaZulu-Natal, the DUT and MUT. DUT employs just over 3000 staff including contract personnel across the 7 campuses in the Durban and Pietermaritzburg cities. MUT employs more than 500 permanent and contract staff members. The researcher consulted with HR officials from both institutions for confirmation of the number of staff employed. Sampling was used to save time as studying the total population would have required an extensive amount of time. In line with the objectives and the purpose of the study, only library staff members were sampled for this study.

Academic libraries in the UOTs employ library staff to perform different duties due to their experiences and qualifications. Academic libraries in UOTs commonly employ library staff in positions such as library directors, deputy directors, library managers, faculty/subject librarians, Research support/postgraduate librarians, library assistants, and stack attendance as well as student library assistants (ALA 2016: 1; Raju 2017: 132). A special group

of library staff that the researcher finds to be relevant to the study were sampled for this study.

3.4.1. Target population

The target population refers to a group of people or units from which a researcher wishes to observe, and these becomes the focus of the study (Barnsbee *et al.* 2018: 751). The target population for this study was the academic librarians in the UOTs in KwaZulu-Natal. Librarians that serve academic institutions are referred to as academic librarians (ALA 2021: Para 1, line 2). Academic libraries employ librarians to take over various responsibilities and to perform various roles and duties. The common practice in the South African UOTs is that librarians who are employed to provide professional information services, often have different classifications or titles. Common titles include Subject/Faculty Librarians, Information Librarians, Post-graduate/Research Librarians, Training Librarians, Evening/After-hour Service Librarians, E-Resource Librarians, and Reference Librarians (Mthembu 2018a: 2). This category of librarians who perform professional services is believed to be providing services that are directly supporting the teaching and learning and the curricula of university students and academics (Raju 2017: 255).

To align with the objectives and purpose, as well as to answer the research questions posed by the study as presented in Chapter One, the sampled population was limited to library staff members who are employed to provide professional information services such as marketing and the promotion of library information resources, information literacy training, user education, research support, collection development and faculty liaison. DUT has 15 staff members who provide professional service to the DUT community, while MUT has 6 staff members who are employed to provide professional services to the MUT community. The total number of academic library staff members from the two UOTs in KwaZulu-Natal who met or qualify in the category targeted by the study, is 21.

3.5. SAMPLING METHOD AND SAMPLE SIZE

3.5.1. Sampling method

The study identified participants who were believed to be key informants to the enquiry and were available to respond. The researcher purposively selected academic librarians who are employed to provide professional information services. The study applied a nonprobability sampling method known as purposive or judgement sampling for this study. As outlined by Campbell *et al.* (2020: 653), purposive sampling allows the researcher to sample participants strategically, and the sampled participants are capable of responding to the research questions relevant to the study. This method allows for depth of understanding rather than breadth of understanding. According to Ames *et al.* (2019: 6), purposive sampling involves two types, judgement sampling and quota sampling. Sekaran and Bougie (2016: 248) confirm that purpose sampling is a viable sampling method based on the judgment of the researcher and that the respondents meet a specific criterion to be included as part of the sample of the study. The sampled librarians were perfect for the study as they met the requirements stipulated by the researcher.

Vasileiou *et al. (*2018) state that “qualitative research experts argue that there is no straightforward answer to the question of how many and that the sample size is contingent on several factors relating to epistemological, methodological and practical issues”. Determining the sample size was not an easy task for the researcher, as the numbers of the target population and sampled population were very different and there was a substantial gap between the numbers from the two institutions.

The table below shows the total of the targeted population, a sampled population and the total number of research participants:

Table 3.2: Summary of target population sampled and research participants

Institution	**Target population**	**Sampled population**	**Research participants**

DUT	74	15	6
MUT	37	6	5
Total	**111**	**21**	**11**

The researcher needed to collect responses from academic librarians who were responsible for providing library professional information services. Owusu (2018. : 25) suggests that academic librarians who provide professional services are normally involved in services such as collection development, information dissemination, training, and marketing of the library services, resources, and facilities to the university community. Items such as the university registry containing a list of students or staff, staff email list, class roster, and telephone directory may be used as sample frames from which the element of the population is drawn (Sekaran and Bougie 2016: 240). The lists of academic library staff members employed at the two UOTs were requested and received from the respective libraries via email. The lists were used as sample frames. The researcher also received lists of library staff members who met the criteria mentioned in the letter of information from the management of both university libraries, which made it easy to contact the participants relevant to the enquiry.

3.5.2. Sample size

As stated in Section 3.3.2, the study was conducted in two universities of technology in the KwaZulu-Natal province. The two institutions were selected as these are the only UOTs in the province. Currently, UOTs are using their technological strength as one of the main strategic points to market themselves as the best institutions using technology to enhance teaching and learning to potential students and staff (Rambe 2016: 86). Universities of technology are now seen as great ambassadors of technology. The researcher found the UOTs to be relevant to this study.

It is important to note again that the population was sampled to obtain participants relevant to the study. The study applied purposive sampling to ensure that all participants can answer the prepared semi-structured questions. Determining the sample size for this study was indeed a challenging process

as the researcher aimed to explain how the sampled size was decided. Boddy (2016: 427) argues that there is confusion and a gap between theoretical expectations concerning determining proper sample size. Vasileiou *et al.* (2018: 2) indicate that experts in qualitative research argue that there is no straightforward answer to the question of how many participants should be included in the sample size and that such a decision should depend on the practical issues and epistemology of the study.

DUT has 15 academic librarians who provide professional services, while at MUT 6 academic librarians provides professional services to the university community. The researcher sampled a maximum of 11 participants from a total number of 21. This study relied on the following recommendations in deciding on the number of a sampled size:

Bernard and Bernard (2013: 175) recommend that for studies that involve interviewing knowledgeable or experts in a particular field, the study should include between 10 to 20 participants. The said number is believed to allow the researcher to uncover and understand the important categories, if the sampled category is also well defined in the study.

Shetty (2021: Para 1, line 2) states that some studies have noted that having a sample size as small as 10 can be extremely fruitful and still yield applicable results, as long as a clear recruiting process is put in place to ensure validation and quality of data collected.

Smith and Shinebourne (2012: 53) suggest that researchers that are engaged in interpretivism studies may sample between 3 and 10 participants for interviews. However, issues specific to the study should also be considered as part of the explanation of the actual number chosen as the sample size.

3.6. DATA COLLECTION

The researcher prepared semi-structured interview questions that were used to collect data via interviews with the participants. Some of the benefits of using semi- structured interviews in qualitative inquiry includes allowing participants the space to express their views in their terms, as well as providing trustworthy and comparable quality data (Evans and Lewis 2018: 2). Due to the current

COVID-19 pandemic, the researcher conducted online interviews using Microsoft Teams to avoid any physical contact with the participants.

MS Teams is an online tool that allows for audio and video callings that can be recorded. In the higher education system, Teams, as it's commonly called, is used among the teaching and learning tools as part of the Microsoft Office 365 suite (Hai-Jew 2020: 7).

Meetings were set up with MS Teams after receiving confirmation from participants who volunteered to take part in the study. Participants were invited individually to join MS Teams meetings, which were scheduled at times and dates that were convenient for each participant. MS Teams was used to conduct and record the interviews with participants. “If the researcher is audio- or video-recording data collection, then the recordings must be transcribed verbatim before data analysis can begin” (Sutton and Austin 2015: 227). MS Teams is one of the newest tools used in recording interviews, educational classes, webinars and workshops, training and meetings. It has been identified as a system that encourages collaboration and enhances communication in todays’ world (Winqvist 2021: Para 1, line 1). This new tool allowed the researchers to activate and set up transcriptions for the recordings at the beginning of each interview with the participants.

The initial time allocated during each interview was one (1) hour. However, all the interviews took less than the allocated time. The researcher allocated 1 hour for each interview to ensure that all the follow-up questions could be included in each interview in cases where participants did not understand the question or did not answer all aspects of the questions. All the interviews were conducted in English, as all participants were perceived to be competent in the English language. The initial plan was to conduct and complete interviews by the end of December 2020. However, with ethical clearance and the gatekeepers’ letter process taking longer than expected, interviews were conducted from 17 November 2020 to 30 March 2021.

3.6.1. Data collection instrument

An interview schedule was used as a data collection instrument (refer to Annexure F) Interviews have been recommended as one of the most effective tools for collecting qualitative data in social sciences (McGrath, Palmgren and Liljedahl 2019: 1002; Kvalsvik and Øgaard 2021: 2).

3.6.1.1 Interviews

The researcher used interviews as a data collection method. This approach allows the researcher to pose direct questions, and this technique is deemed as an operational and reliable way of collecting reliable data from research participants. This method is also appropriate and suitable, as it allows the researcher to explore in an in-depth way, issues that are unique to the experiences of the research participants (McGrath, Palmgren and Liljedahl 2019: 1002). In today's world, because of technological advances, qualitative researchers can use the internet for online interviews to save time (Gray *et al.* 2020: 1293). The researcher used online interviews to save travelling costs and time. “Currently, video conferencing is typically used to save costs” (Gray *et al.* 2020: 1293).

Each participant was provided with an interview schedule to prepare for the interview. The interview schedules were provided to the participants a few days before the actual interview. This process was followed to allow participants to verify and confirm their voluntary participation as this process gives them a clear insight into the interview questions before the actual interview. A total of 21 semi-structured questions were prepared for the study. The interview schedule used for participants was centred on finding out the perceptions of academic librarians on:

- social influences contributing to the behavioural intension to adopt mobile technology as a delivery model for library services,
- the usefulness of mobile technology as a delivery model for library services,
- the effort required to adopt mobile technology as a delivery model for library services, and

- the facilitating conditions contributing to the adoption of mobile technology as a delivery model for library services.

The researcher used email communication to transmit the interview schedule to participants. The purpose of sharing the interview schedule was to allow the respondents to prepare their responses and to respond adequately as suggested by Heath *et al.* (2018: 32). The interview schedule was also displayed on the screen during the interview to allow the researcher to read the question, in cases where network problems persisted.

3.6.1.1.1 Profiles of interviewees

Table 3.4 is a breakdown of the 11 interviewed participants from the two UOTs. The sample size was made up of six (6) professional librarians from DUT, and five (5) professional librarians from MUT. The professional librarians consisted of participants employed as a subject or faculty librarians and research support or postgraduate librarians. The participants are represented in special codes designed by the researcher to protect the identity of the participants. Twenty-one questions were included in the interview schedule.

Table 3.4: Details of interviews and participants' codes

Date	Duration	Codes	Organisation	Interviews
17/11/2020	48 min 13 sec	PLDUT1	DUT	Interview 1
20/11/2020	43 min 58 sec	PLDUT2	DUT	Interview 2
11/12/2020	32 min 28 sec	PLDUT3	DUT	Interview 3
15/12/2020	44 min 45 sec	PLDUT4	DUT	Interview 4
15/12/2020	53 min 03 sec	PLDUT5	DUT	Interview 5
17/12/2020	42 min 18 sec	PLDUT6	DUT	Interview 6
16/03/2021	23 min 22 sec	PLMUT1	MUT	Interview 7

19/03/2021	56 min 24 sec	PLMUT2	MUT	Interview 8
23/03/2021	22 min 11 sec	PLMUT3	MUT	Interview 9
29/03/2021	32 min 15 sec	PLMUT4	MUT	Interview 10
30/03/2021	28 min 23 sec	PLMUT5	MUT	Interview 11

All interviews took less time than the 60 minutes allocated, with an average of 22 minutes per interview. The shortest interview took just under 23 minutes, while the longest interview took 56 minutes and 24 seconds. As confirmed by Maguire and Delahunt (2017: 3355), researchers may develop special codes to protect the study participants' details. There are different ways of coding that can assist in protecting the participants' identities in a study. The researcher allocated codes for each interview. Each code was allocated a numerical number. The special codes are arranged in sequential order in the table. The codes used are defined as follows:

PLDUT= Professional Librarian Durban University of Technology

PLMUT- Professional Librarian Mangosuthu University of Technology

3.6.2 Pilot testing of the instrument

Hilton (2017: 25) confirms that pretesting is regarded as a highly effective technique that can be used to improve validity in qualitative data collection procedures, as well as the interpretation of findings. Researchers use a pretesting method to confirm or check if the questions are understood and being interpreted as intended (Hilton 2017: 22). The researcher used a pretesting process to validate if the questions prepared for the interviews were of good quality and relevant to the objectives of the study. There are various types of pretesting methods available for researchers (Lenzner, Neuert and Otto 2016: 1). The researcher applied a type of pretesting method known as a cognitive interview. Cognitive is much more relevant and suitable for qualitative interviews as it increased the validity and reliability of the data collected in a qualitative study (Peterson,

Peterson and Powell 2017: 3). This method allows the researchers to practise with their planned questions to actively probe the way participants answer questions (Lenzner, Neuert, and Otto 2016: 2).

Academic librarians who were not part of the main interviews, were interviewed as part of pretesting to validate the data collection material. Interviews were conducted online via MS Teams. Conducting interviews via the MS team was also in line with complying with the current COVID-19 protocols, as recommended by the South African Government (South Africa 2021: para.11, line 12) Emails were sent to chosen participants requesting them to indicate their interest to voluntary participation in the process. Participants were provided with the interview schedule two (2) days before the actual interviews to allow them time to confirm if they wish to continue or retract from the process. The researcher conducted three interviews with academic librarians who were not part of the main interviews. This process was followed to identify potential errors, identify changes to be implemented before the study is carried out, and look at the warnings regarding the failures and practical problems related to data collection instruments.

Howard (2018: 8) argues that researchers who use pretesting for a qualitative study should determine their specific concerns. The researcher identified both wording issues and face validity as the main concerns of the study to explore the depth of the responses from participants. During the pretesting, one of the participants requested that two of the questions be rephrased. Table 3.5 shows the original questions and the rephrased questions.

Table 3.5: Original and rephrased questions during pretesting

ORIGINAL	**REPHRASED**

Do you feel that you have enough knowledge regarding the use of mobile technology to deliver library services? If yes, please elaborate on the knowledge you have and if no, please elaborate on the knowledge you feel you need to learn more about.	How well do you know about providing library services via mobile devices such as smartphones, laptops and tablets? Please share your knowledge in this regard.
In your view, do you feel the library is doing enough to make its library services accessible via mobile devices?	In your view, is your library doing justice in making services accessible via mobile devices? If yes, please provide examples and if no, please elaborate on what the library should be doing to make services accessible via mobile devices.

The researcher prepared two rephrased questions as reflected in the table above, for cases where participants may not understand the question as it was experienced during pretesting. However, none of the participants during the main interviews requested that any of the questions be rephrased.

3.6.2.1 Data collection challenges

The researcher had to reschedule some of the interviews due to various reasons. Some of the factors that contributed to the extension of the data collection period are alluded to below:

- Network and data

  some of the participants had network problems while being interviewed from their homes. The researcher also experienced a network problem where some of the calls were cut off in the middle and were rescheduled to a later date. Another challenge in this regard

was data, as two of the interviews were also rescheduled when data was finished in the middle of the interview.

- Load-shedding

  This is a common situation in South African, where electricity is cut off in certain areas for certain periods. The time and dates at which the electricity is to be cut off are normally announced via social networks, municipal websites, and other media platforms such as TV, Radio, and newspapers. Load-shedding affected some of the scheduled meetings.

3.7 DATA ANALYSIS TECHNIQUE

The study applied a type of data analysis technique called text analysis, also known in the research field as thematic analysis. As confirmed by Kuckartz (2019: 181) this approach is highly recommended for qualitative studies. The researcher utilised the NVIVO software to analyse data. This process was followed to allow a thematic analysis to take place as the study planned to use thematic analysis. A study by Sivakumar (2020: 57) states that the concept of thematic analysis is among the most popular approaches to qualitative analysis since it identifies, analyses, and reports patterns within data concerning social phenomena. Full details on the process followed in analysing the collected qualitative data is provided in chapter four of this study.

3.8 ETHICAL CONSIDERATION

It is essential to consider and apply ethical principles when conducting research (Arigo *et al.* 2018: 12). When research ethics are not considered and applied in a study, the validity and reliability of the study may be affected (Woodrow 2014: 26; Kim and Loewenstein 2021: 320). The researcher respected and followed the following ethical principles to ensure ethical consideration:

- Participants were informed fully about the purpose, intentions, and method to be used in the study.
- To conduct this study, the researcher sought permission from all relevant gatekeepers.

- Participants were provided with a letter of information and were also requested to sign the informed consent form, before participating in this study.
- The researcher informed the participants that their participation was voluntary and should they wish to withdraw from the study at any given time, they could do so.
- In addition, data collected was treated with confidentiality and participants were informed that their names would not be used in the study.

The Faculty of Accounting and Informatics Ethics Committee, also known as the FREC, approved the chosen methodology and the data collection instrument of this study under ethical approval level 2. This process was followed to ensure the privacy and protection of all participants before the commencement of data collection. The process of seeking permission and ethical clearance was not an easy one. The researcher started the process of seeking ethical clearance and permission from the DUT and MUT gatekeepers from June 2020 until February 2021. The country's lockdown due to the current COVID-19 pandemic contributed to people and departments making delayed responses, as many of the university's staff were either not working at all or working from home. One of the other reasons that further delayed the process was that the ethics committee meetings where decisions are taken regarding ethical clearance, were not taking place due to the current pandemic. Between September 2020 and February 2021, the researcher applied and received the following gatekeeper and ethical clearance letters:

Table 3.3: Dates of Ethical clearance and gatekeepers' letters

Date	**Gatekeeper/Ethics Committee**
04 Sept 2020	DUT Faculty of Accounting and Informatics Research Ethics Committee (FREC)
15 Sept 2020	DUT IRIC (Institutional Research and Innovation Committee)

16 Sept 2020	DUT Library Directorate gatekeepers' permission letter to conduct interviews
08 Feb 2021	MUT Research Ethics Committee (REC)
24 Feb 2021	MUT Library Directorate gatekeepers' permission to conduct interviews

After receiving the official ethical clearance letters, the researcher further requested and received gatekeepers' letters from the Library Management of the two institutions. At the DUT Library, approval to proceed with contacting library staff was obtained from the Library Director and one of the Library Managers. At MUT, approval was granted by the Senior Library Director and the Deputy Director. Approval letters were received via email. Letters are attached as annexures A, B, C, D, and E.

3.9 CONFIDENTIALITY AND ANONYMITY

Researchers are required to maintain confidentiality once they have information in their possession, and especially when it comes to the extent of the information they disclose. The concept of anonymity, however, is about the attribution of information:

- can individuals be identified?
- Is it possible for them to be identified by the data that they provide or by other information about them? (Sim and Waterfield 2019: 3008).

It has been regarded as a good practice and part of the ethical guideline to protect the participants' identity in research (Brittain *et al.* 2020: 926). Arifin (2018: 30) argues that protection of study participants through the application of correct ethical practices such as ensuring confidentiality and anonymity is essential in qualitative studies. However, Kaiser (2009: 1632); Roth and von Unger (2018: Para 15, line 11) argue that qualitative studies often require the researcher to give a detailed description of their participants, and even when participants' names are not mentioned, sometimes such details could be

traceable to the description such as responsibilities, age, or years of service, which in turn might compromise the participants' identities.

The researcher did not include or use the participants' names in the study to protect their identities. Data was reported without revealing the participants' details. Special codes were introduced to represent the participants without mentioning their names or position, as indicated in Table 3.2. under sample size.

The collected data is kept safe using a secured online cloud record-keeping tool. Data collected will be deleted after five years of the study. As part of embracing the ethical research principles, researchers should refrain from providing participants' details in the study. All participants were informed that their participation was voluntary and consent forms were also signed by participants who agreed to take part in the study. The researcher also provided all the participants with the letter of information. The letter of information provided details of the study such as the purpose, title, outline of the procedure, contact details, as well as general information about the study. The participants were also made aware that they were under no obligation to participate and they were also allowed to withdraw their participation at any time during the interview. The anonymity and confidentiality of the participants were protected, as the researcher did not use the names and titles of the participants in the analysis of the data collected.

3.10 VALIDITY AND RELIABILITY

Research validity and reliability are essential elements to demonstrate the quality of research in the field of organizational behaviour. Qualitative research studies are better at demonstrating validity. However, qualitative research methods and techniques differ widely, so there is no universally accepted method to assess validity (Hayashi Jr, Abib and Hoppen 2019: 98). Cypress (2017: 254) argues that reliability and validity are 2 key aspects of all research.

Researchers are encouraged to guarantee that the chosen research methodology and data collection tools used are both valid and reliable, as this helps to showcase that the research conducted is of quality (Hayashi Jr, Abib

and Hoppen 2019: 98). The validity and reliability of the instrument were tested through pretesting.

Some guidelines are recommended for validating research in a qualitative study. This guideline falls into two groups, intrinsic and extrinsic. This study followed the intrinsic group. Intrinsic is the preferred method group for validating qualitative research (Sousa 2014: 213). This method allowed the researcher to ensure the trustworthiness of the study by ensuring aspects such as the adequacy, credibility and reliability of the research questions. Intrinsic guidelines also allow the researcher to apply peer debriefing which requires one to engage with either peers or specialists in the field of data validation. To validate these, the researcher sampled academic librarians who specifically provide professional services to the university community. In addition, both the research questions and the interview schedule were given to a qualitative research expert to provide further assistance in validating both the research questions and the semi-structured questions. The expert went through the research questions and the interview schedule carefully to ascertain the appropriateness and adequacy of the instrument. At first, the researcher had prepared over 26 questions to be included in the interview schedule. The expert provided recommendations on how some of the questions should be restructured. After consultation with the expert, the interview questions were reduced to 21. These recommendations also assisted in ensuring the interviews would take no longer than one hour. The recommendations were modified, and corrections were made.

Before using questionnaires on a particular subject, pretesting is necessary to make sure they are appropriate for the target groups for the study (Wesselink 2019: 42). Having validated the interview schedule, a pretesting process was carried out to test the questions with three academic librarians from the Durban University of Technology. The decision to pre-test the interview schedule using participants from the DUT was because the ethical clearance was received from DUT before gatekeepers' letter was sent to the other participating institution, MUT. The academic librarians used in the pilot pretesting were not part of the main interviews. Participants were consulted via email. Their participation was voluntary. The pretesting was used to check the following:

- Whether the questions were clear enough and easily understood.
- Whether there was a need to include more items in certain areas
- Whether there were some items to which they would not like to respond.

3.11 DELIMITATIONS

According to Theofanidis and Fountouki (2019: 157), delimitation allows the researcher to set limitations to limit their work to allow the study's aims and objectives to become possible to realise. The study was limited to UOTs in the KZN province instead of all universities in South Africa. UOTs are currently using their technological strength as one of the main strategic points to market themselves as a type of institution using technology to enhance research, teaching, and learning to potential students and staff. (Rambe 2016: 86; Masinde and Roux 2020: 35). Around the world, they are also commended by government higher education ministers and research institutes for proving technological solutions to social problems (Du Pre 2009: 1). The researcher was based in the KZN Province, and this assisted him in the decision not to include all UOTs in South African, but to focus on the UOTs in the KZN area.

3.12 LIMITATIONS OF THE STUDY

Limitations in a study can assist the researcher in setting up a set of guidelines and can also help in ensuring the effectiveness of the study (Queirós, Faria and Almeida 2017: 372). The researcher limited this study to academic librarians because of their roles and responsibilities, which allow them to have a much better understanding of the adoption of mobile technology as a delivery model for library services in academic libraries. The researcher limited the study to focus on academic library staff members employed as Subject/Faculty Librarians, Reference Librarians, After-hours/Evening Librarians and Postgraduate Librarians. These library staff members are responsible for marketing, promoting, and training library services and facilities, faculty liaison, and collection development. Limiting this study to the mentioned population assisted in focusing on the staff members who were deemed relevant to answer the questions aimed at achieving both the objectives and the critical questions of the study. Using purposive sampling, only participants who were providing

the services listed, were included. As confirmed by Bedi and Walde (2017: 321); Johnson (2019: 92); Li and Li (2021: 474), the academic librarians who were chosen for this study are normally given the responsibility to manage collection development, provide library instruction and information literacy in classrooms, promote library resources using various methods, as well as take responsibility in building a bridge between library resources, service, and library users. The mentioned groups were targeted as the researcher believes they can attend to the research queries used in the interview schedule. The study was also limited to the UOTs in KZN as studying all South African universities was not feasible.

3.13 CHAPTER SUMMARY

Chapter Four depicted the investigation style that the researcher used in the study, as outlined in Table 3.1. It is vital in research to provide details of how a researcher decides to choose a population, sample size and target population. As a result, the researcher in this chapter provided extensive detail on the research design, target population, and the data collection tools used, with further justification for how the tool was tested for its reliability, validity and relevancy. The researcher also outlined details of how the size of the sample was decided. This was backed up by relevant literature

in the field. The chapter provided details on how the participants were profiled to protect their identity by using special codes when transcribing video interviews to word transcriptions. The researcher also provided information on how the methodology was justified and validated, the scope of the study and the limitations of the study.

Another important aspect of the study described here is the ethical consideration. The study discussed the significance of the research ethics considered and prioritised by the researcher. Furthermore, the chapter also discusses how data was analysed with details of how the tool NVIVO was used to develop codes and themes after the transcribing of data from video interviews to word transcripts. The chapter concludes with a discussion of some of the challenges experienced during the data collection process. The next chapter will provide a presentation of data and interpretation of data, as well as an analysis of data collected.

4 CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

The previous chapter discussed the methodology and data collection methods used in this study. In this chapter, the researcher analyses and interprets the qualitative data obtained from the interviews with participants. This chapter starts by presenting and analysing biographical data to demonstrate the different ages, races, gender, qualifications, and experiences of the academic librarians employed to provide professional library services to the UOTs' community. However, the main focus of this chapter is to discuss in detail, the data collected from academic librarians on the social influences, performance expectancy, effort expectancy, and facilitating conditions that may be contributing to the adoption of mobile technology as a delivery model in academic libraries. In addition, the chapter also provide details on how the study objectives were achieved.

4.2 DATA ANALYSIS

The researcher started with the data analysis process after the data collection was completed. The data analysis process allows the researcher to generalise findings from the population surveyed as well as to reduce data by identifying specific themes and coding data (Elliott 2018: 2854). As confirmed by Lester, Cho and Lochmiller (2020: 96), data analysis is an important process of organising information into meaningful data. Though there is no formal data analysis step, using this method allows the researcher to confront generalizations with a formalized body of knowledge in the form of constructs or theories. In addition to identifying comparable phrases and themes in the data, researchers also gain an understanding of the consistency apparent in the data through the process of elaborating small sets of generalisations. (Lester, Cho and Lochmiller 2020: 96). The researcher transcribed the obtained information

from interview sessions with the academic librarians from the UOTs in KwaZulu-Natal. Video interviews were transcribed into word documents to allow the process of identifying themes in the study using NVIVO. A total of 11 documents were created, as there were 11 video interviews conducted with the participants. Thematic analysis was used to analyse the data collected. To enable this process of analysis, the researcher used the interpretative phenomenology approach as suggested by (Cuthbertson, Robb and Blair 2020: 94). Interpretive phenomenology allows for practical knowledge to be visible, to offer a powerful way to increase perceptual insight; this can be made possible by using a well-suited method such as thematic analysis (Qutoshi 2018: 218). The study used thematic analysis as an appropriate foundational method of analysis for seeking to understand experiences, thoughts, or behaviours across a data set as confirmed by Kiger and Varpio (2020: 1).

In the process of transcribing videos into word documents, the following steps took place to validate the data collected:

- Translating mistyped words from the script. Some of the words were not picked by the system in the process of transcribing.
- Removing duplicated words and sentences.
- The researcher translated recorded video information, rearranged it and moved the data into a hard copy setup, in which the evidence was previously coded, by using the study objectives to classify it into a particular order.

4.3. PRESENTATION OF INTERVIEW DATA

As outlined by Ingole (2020: 10538), professional librarians are skilled and experienced staff employed to provide more advanced services. “Library services are those activities or functions that are offered in the Library to assist users with their information needs”. Some of the professional services include collection development, training and marketing services via digital spaces, liaison and communication with stakeholders, design of the digital library, preservation, organisation and management of digital collection, planning,

support, and implementation of digital services such as information literacy and research support services and consultations (Panahi, Roostaei and Nemati-Anaraki 2021: 8). The interviews were conducted with professional librarians who are employed as Faculty/Subject librarians, Training Librarians, Research support/Postgraduate librarians, and Evening/Reference librarians. In the previous chapter, it was mentioned that the interviews took place from 17 November 2020 to 30 March 2021.

While generating themes, the participants' general statements were used to support each theme generated. The researcher followed a hermeneutic style of interpretation that is also supported by word-for-word statements from respondents as recommended by Dabengwa, Raju and Matingwina (2019: 4). The interview schedule was divided into two sections, with Section A collecting biographical details and Section B collecting views and perceptions of respondents centred around the four objectives of the study. A total of 7 questions were used to confirm biographical data, while 21 questions were used to collect qualitative data from participants. However, both the biographical and qualitative data are presented under one section in the study.

4.3.1 Gender

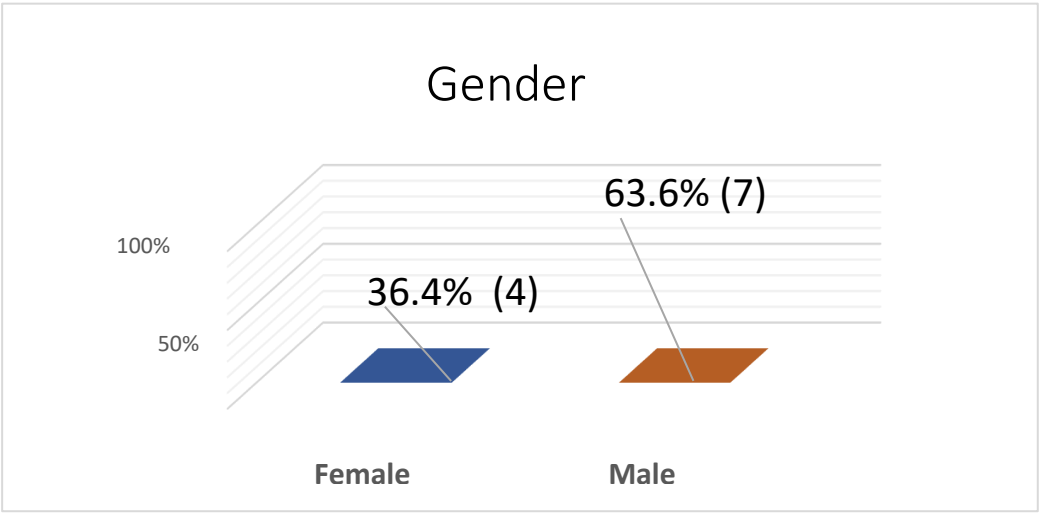

Figure 4.1: Gender profile

Figure 4.1 reveals the gender profile of the academic librarians who participated in the study from both the DUT and MUT universities. An overwhelming majority of 63% (n=7) academic librarians were male, with the remaining 36.4% (n=4)

being female. Lombard (2018: 226) argues that although globally academic libraries are female- dominated, many of the leadership and middle management positions in academic libraries are still male-dominated. Mbambo-Thata *et al.* (2019: 1) also argues that traditionally women have been in the majority in the academic library workforce while men held leadership positions. The targeted group by the study is also known to form part of the middle management group at the academic libraries in the UOTs.

4.3.2 Race

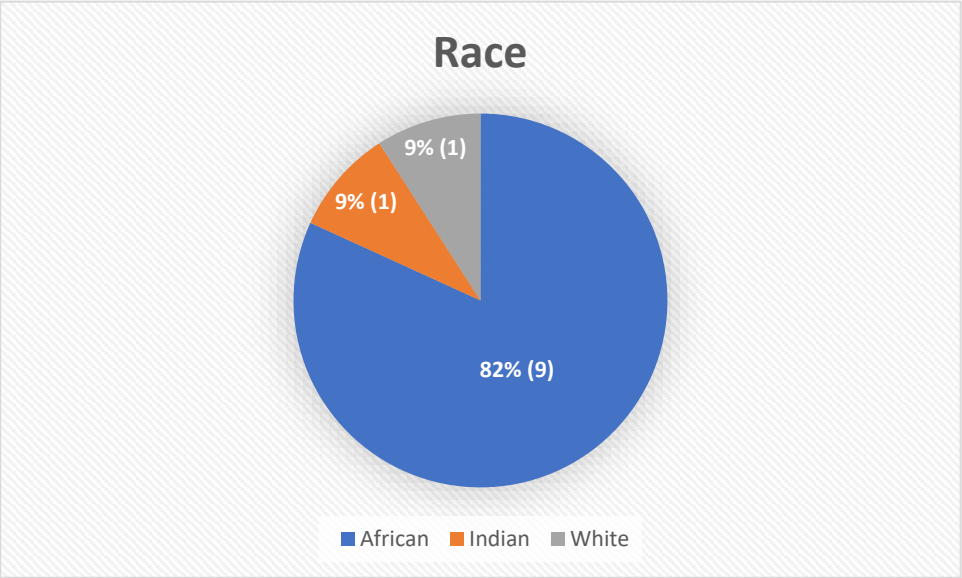

Figure 4.2: Race profile

Figure 4.2 reflects the number of academic librarians that participated in the study according to race profiles. This section comprises three (3) racial groups, namely, African, White, and Indian. An overwhelming majority of respondents were Africans with 82% (n=9) compared to the 9% of Indian (n=1) and 9% of white (n=1) respondents. According to Neely, Peterson and Todaro (2007: 5), in the US, many libraries, including university libraries, reported a low number of black employees. The research conducted by Semenza, Koury and Shropshire (2017: 89) suggest that race and ethnicity are among the challenges libraries face when dealing with diversity. Race is an area that need to be continuously examined and assessed to ensure equality and complete diversity in the workplace (Ocholla 2002: 63).

4.3.3 Age groups of Academic Librarians

A study conducted by Van der Walt and Du Plessis (2010: 7) argues that only a few academic libraries are recognising the need to consider with urgency the need to employ new librarians with new skills needed to serve today's users. Semenza, Koury and Shropshire (2017: 91) argues that South African academic libraries are confirmed to form part of the cohort that has the most ageing library staff, especially when it comes to technical and skilled academic librarians. The study also suggests that academic libraries need to start recruiting new and young skilled librarians who can assist in serving today's users, using today's technology. It was important for the researcher to collect staff age profiles since this data can help determine whether employees in KwaZulu-Natal were also experiencing the same situation in terms of upskilling and acquiring new skills in their professional careers. The participants' age profile is shown in Figure 4.3.

About 36.3% (n=4) participants from the studied institutions were between the ages of 36 and 45. Despite being experienced librarians, this age group indicated a need to get more training and update skills regarding the use of mobile technology to provide services. Three (3) participants (27.2%) were between the ages of 25 and 35. Another 3 participants (27.2%) were between the ages of 36 and 45, while there was only one participant (9%) who was between the ages of 46 and 55.

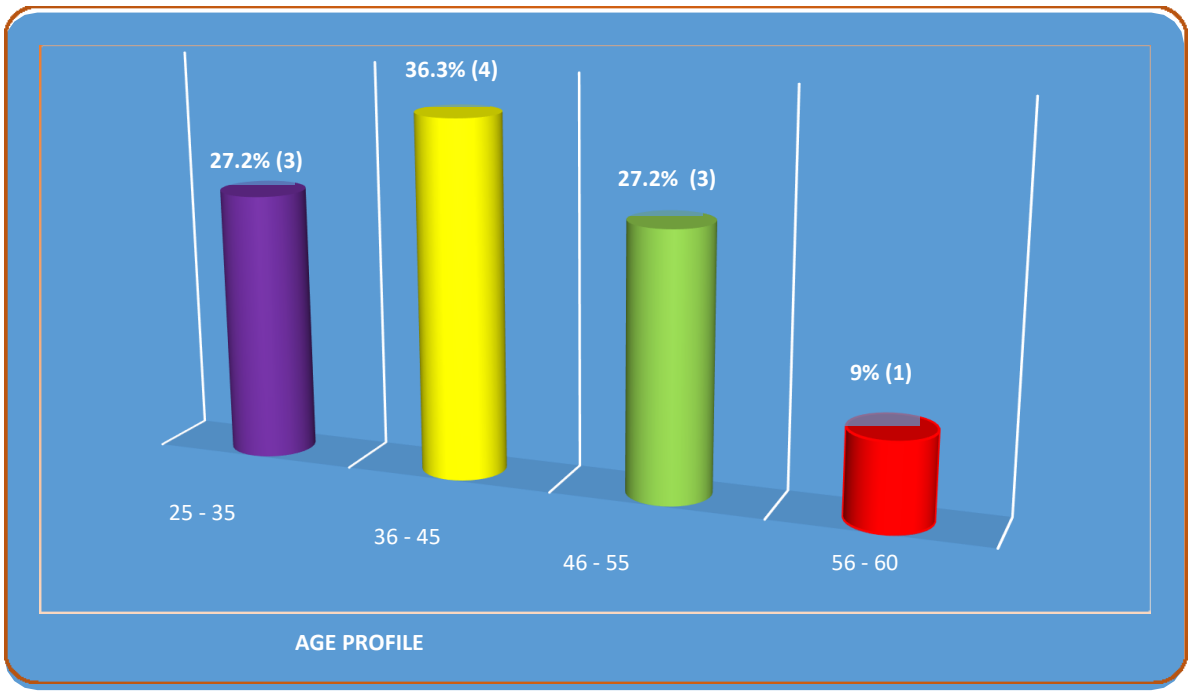

Figure 4.3: Age group profile

4.3.4 Various positions of Academic Librarians

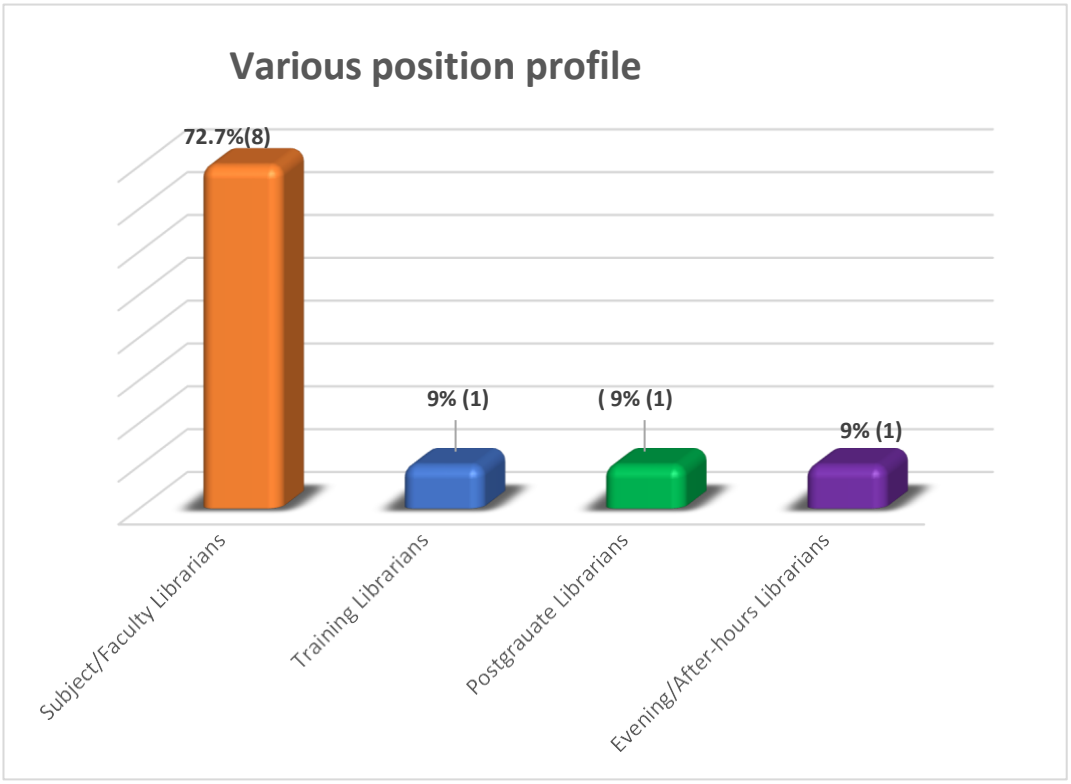

Figure 4.4: Position profile

Figure 4.4 shows the different positions occupied by academic librarians employed to provide professional services to their respective university communities. Mugwisi (2015: 33); VanScoy (2019: 428) indicate that many academic librarians employed to provide professional services are employed in the positions of faculty librarian, training librarian, and e-resources librarian. The researcher concurs with the mentioned literature, as this study also shows that the majority of respondents 72.7% (n=8) were employed as faculty/subject librarians. The remainder of the three (3) participants were employed in the positions of Training Librarian, Postgraduate librarians, and Evening/After-Hours Librarian.

4.3.5 Primary tasks and responsibilities

The following were listed as primary tasks and responsibilities by the respondents:

Table 4.1: Primary tasks and responsibilities

- Information services
- Teaching and training of Information literacy, databases, and electronic resources
- Collection development
- Research support
- Databases and electronic resources
- Provide training and development support to academic and library staff
- Marketing and communication of library services and resources

It was essential to find out from academic librarians in the UOTs, their current primary tasks and responsibilities as literature suggest that current knowledge

of the emerging ICT with regard to the use of educational platforms via social media and mobile technology is essential for academic libraries. Ciccone and Hounslow (2019: 18) indicate that academic libraries are now requiring librarians with ICT skills and knowledge on the use of social media and mobile technology to deliver library services.

Academic librarians provide professional services such as teaching and training of library resources support, collection development and management, research support, and many other professional services. However, librarians are also starting to recognise the need to upskill and learn more about mobile technology as a technology that students are already using to access other university and schools' services (Julien, Gross and Latham 2018: 185).

4.3.6 Years of experience of respondents

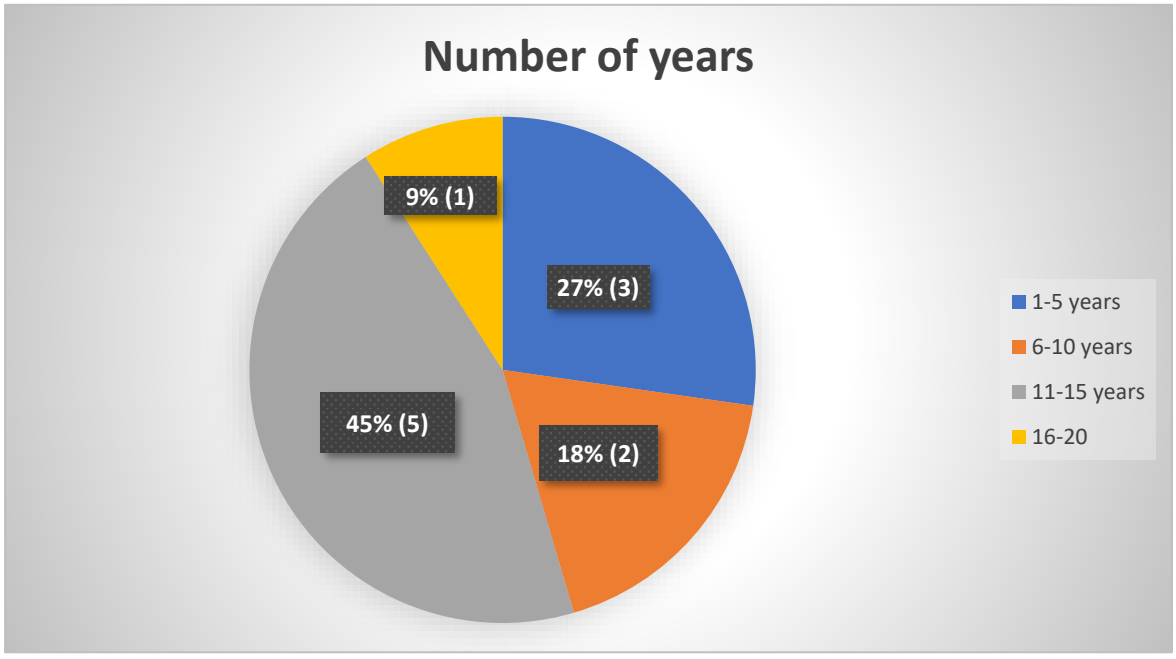

Figure 4.5: Years of experience profile

A majority of the participants, about 45% (5 out of 11) had at least 11 to 15 years of experience. Two (2) of the respondents had between 6 and 10 years of experience in their current positions. About 27% (3 out of 11) of the respondents had between 1 and 5 years of experience in the academic library space. Only 9% (1 out of 11) of the respondents had between 16 and 20 years of

experience. This information assisted the researcher in understanding the experience levels of respondents. Figure 4.5 shows the years of experience profile as discussed above.

Most of the respondents that had about 11 to 15 years and 16 to 20 years of experience were identified by the researcher under section 4.2.3 as librarians under the age category 36-45 as well as category 45-55.

4.3.7 Highest qualification in LIS (Academic Librarians)

All the participants had library qualifications. As indicated by Mthembu (2018b: 2), those employed to execute professional information services in South African academic libraries need to have an LIS qualification from either a traditional or a modern university. A study by Okeji, Tralagba and Obi (2019: 319) also shows that the majority of professional librarians employed at the academic libraries in Nigeria hold either a master's degree or Bachelor degree while serving as professional librarians. To provide efficient services in the 21st century libraries, librarians need to have a formal qualification, especially in the academic sector, where libraries play a vital role supporting academic and students (Tzanova, Bossu and Heck 2020: 283).Table 4.2 shows that, of the eleven librarians who participated in the study, 1 obtained a PhD, 5 of them obtained a Master's degree, 2 of them obtained a Bachelor of Technology (BTech) degree, and the other 3 obtained an Honours degree in the Library and Information Studies field.

Table 4.2: Highest qualifications

WHAT IS YOUR HIGHEST QUALIFICATION?	
QUALIFICATION	**PARTICIPANTS**
PHD	**9% (1)**
MASTER'S DEGREE	**45% (5)**
HONOURS DEGREE	**27% (3)**

BTECH DEGREE	**18% (2)**

4.3.8 Is library management encouraging librarians to adopt mobile technology?

Participants were asked to indicate if their library managers were encouraging the use of mobile technology to access and provide library services. The majority of participants, 63.6% (7 out of 11), indicated that library management did encourage the use of mobile devices to provide and access library services. Participants mentioned that they were provided with laptops by library management and no longer using desktops computers. Two of the participants also indicated that they were encouraged to attend training on how to use mobile devices for library services.

About 36.3% (4 out of 11) was split between those feeling that management was not encouraging staff to use mobile technology (2 out 11), and those feeling that although they were given laptops, management could do more to encourage the adoption of mobile technology in their libraries (2 out of 11). One of those participants who felt that management could do more, also suggested that library managers and directors should prioritise arranging more workshops and further sessions on how librarians can use mobile devices to provide library services. Benchmarking with other institutions was also mentioned by one participant as another option to be considered by library management. In addition, 5 participants from the total also indicated that librarians also encourage each other to adopt mobile technology as they often help each other with peer-to-peer sessions.

4.3.9 Users enquiring about mobile technology services

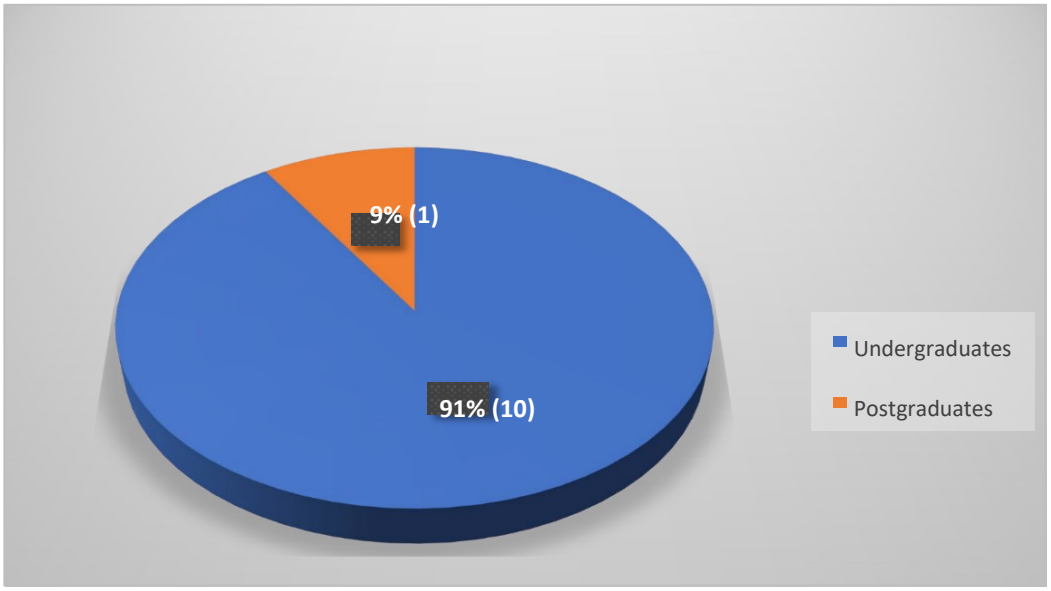

Figure 4.6: Users enquiring about services accessible via MT

Participants were asked to indicate whether users are seeking out mobile-friendly services and what type of users are inquiring about these services. The majority, 91% (10 out of 11), of the participants indicated that it is mainly the undergraduate students who inquired about the services that can be accessed via mobile devices. Only 9% (1 out of 11) participant indicated that in their faculty, mainly the postgraduate students enquired about services accessible via mobile devices as they do not attend classes and they find it challenging for them to come to the campus; however, they can access some of the services remotely using their mobile devices. These responses confirm that social influences are influencing the adoption of mobile technology to provide library services. This is also supported by Morgan, Gipson and Robinson (2019: 79) who argue that mobile technology has impacted how users engage with information and, as a result, librarians have to change from their traditional ways and adopt the modern ways of providing services using mobile technology. Most of the users who are encouraging this behaviour are undergraduate students, who are enquiring about the services that can be accessed via mobile technology and are making librarians want to learn more about providing services accessible via mobile technology.

"*Personally, I am very encouraged by our undergraduate students who keeps on enquiring about accessing some of the library services via mobile devices. It*

shows that our students are indeed ready for these services and it is time for libraries to introduce more mobile services" said PLDUT3

The social factors mentioned above, according to some of the participants, influenced their intentions to use mobile technology. Bozan, Parker, and Devey (2016: 3107) confirm that behavioural intentions and use behaviours are directly linked to the social construct of the UTAUT model.

4.3.10 Main influences of librarians moving towards mobile technology

The researcher used this section to solicit the perceptions of participants on the main influences of people wanting to move to mobile technology regarding library services.

About 45% (5 out of 11) of the participants mentioned that the current trends such as following best practices in providing services to today's users, new information-seeking behaviour by users, the Fourth Industrial Revolution (4IR), continuous growth of ICT, and the current COVID-19 pandemic were identified as some of the influencers for academic libraries wanting to move towards adopting mobile technology as a delivery model for library services. However, all 11 participants mentioned COVID-19 as one of the main influences of people wanting to move towards adopting mobile technology. Okike (2020: 2) also indicates that libraries should be moving towards mobile technology to address the current information needs to assist with the COVID pandemic information needs in a much flexible way. Studies by Anyim (2020: 27); Guo *et al.* (2020: 535); Rafiq *et al.* (2021: 9) also confirm that the COVID-19 pandemic and the current library trends have accelerated and increased the use of mobile technology in delivering services and communication amongst libraries and other information service providers.

A study conducted by Ifijeh and Yusuf (2020: 1) also indicates that in response to the COVID-19 pandemic, some academic libraries in Nigeria are resorting to virtual information services to support the academic program while users are not having face-to-face classes and interactions. As a result of the increasing usage of mobile devices by university students, library services have also been impacted. Many Chinese university libraries are now integrating their services via mobile technology to remain relevant to their users (Xu and Du 2018: 64).

4.3.11 Services accessible via mobile technology offered by librarians

Table 4.3 displays the services and resources that students are most interested to access via mobile devices when contacting academic librarians.

Table 4.3: Services accessed via mobile technology

SERVICES AND RESOURCES MENTIONED	NO. OF PARTICIPANTS
Library catalogue	100% (11 out of 11)
Access to e-Books and eJournals	90.9% (10 out of 11)
Referencing guide	90.9 (10 out of 11)
e-Newspapers	72.7 (8 out of 11)
Library information literacy presentations	54.5% (6 out of 11)
Past exam papers	54.5% (6 out of 11)
Videos and tutorials	27.2% (3 out of 11)
Bookmyne mobile application	27.2% (3 out of 11)

4.3.12 Services and resources promoted by academic librarians

Participants were asked to indicate the type of services and resources they encouraged users to access via mobile devices. Table 4.4 shows the various types of services and resources that librarians were encouraging users to access via mobile devices.

Table 4.4: Resources and services promoted by academic librarians

SERVICES AND RESOURCES	***NO. OF PARTICIPANTS***
e-Books, eJournals, Catalogue/OPAC, Electronic resources/databases,	100% (All participants)

Library discovery tools (Summon and Ebsco Discovery)	90.9% (10 out of 11)
Library tutorials/guide & Subject/Research guides	81.8% (9 out of 11)
e-Newspapers	63.6% (7 out of 11)
Bookmyne application	54.5% (6 out of 11)
Past Exam papers and Library website	36.3% (4 out of 11)
Endnote	27.2% (3 out of 11)

As per the data on the table, the majority of academic librarians were encouraging users to access e-Books, eJournals, library discovery tools, library catalogue or OPAC, and library databases via their mobile devices.

4.3.13 Mobile usage Policy/guideline

Participants were asked to confirm if librarians or institutions have any guidelines or policy document that was used to guide users on the use of mobile technology. All eleven (11) participants indicated that they were not aware of any guidelines or policy that governs or guides the use of mobile technology at their institutions. Kaliisa and Michelle (2019: 3) confirm that a number of studies have previously discussed the need for academic institutions to engage in developing policy guideline for mobile usage and learning.

4.3.14 Mobile technology making life easier

A question was asked for participants to indicate if mobile technology was making their life easier at work. The majority of participants, 90.9% (10 out of 11), agreed that mobile technology made it easier for them to deliver library services to their university communities. Table 4.5 indicates some of the ways mobile technology is enabling academic librarians to manage library services more easily as described by participants:

Table 4.5: Examples of how MT is making librarians' life easier

EXAMPLES OF HOW MOBILE TECHNOLOGY IS MAKING LIFE EASIER	% (HOW MANY)
Being able to access resources remotely	100% (All participants)
Being able to conduct library training from anywhere	72.7% (8 out of 11)
Allowance to connect with users via tools such as LibChat and WhatsApp while away from the office	72.7% (8 out of 11)
Students can attend library training using Microsoft (MS) Teams on their cell phones	63.3% (7 out of 11)
No need to print attendance registers as these can be downloaded from the online platforms	36.3% (4 out of 11)
Mobile technology helps to reduce the fear of contacting COVID-19	18.1% (2 out of 11)

Two (2) participants (18.1%) indicated that they could not confirm if mobile technology was making their life easier yet. One participant (9%) mention that a lack of advanced knowledge on how to effectively use mobile technology to deliver library services effectively is one reason.

4.3.15 Users enjoying services via mobile devices

Participants were asked to indicate if users are enjoying accessing services via mobile devices. About 90.9% (10 out of 11) of the participants confirmed that those who were using the services were enjoying accessing services via their mobile devices. However, participants also indicated that such data was confirmed during informal chats with students and not via formal surveys. One of the constructs of the UTAUT theoretical framework used in the study is effort

expectancy. The researcher also used the participants' responses to further validate the relevancy of the effort expectancy. As indicated in chapter 2 of the study, effort expectancy refers to the degree to which the system perceived by the user is easy to use.

4.3.16 Fully adopting mobile technology as a delivery model for library services

Participants were also asked to indicate if they feel that all academic libraries should fully adopt the MT and why so. An outright majority, 100% (11 out of 11) felt that all academic libraries should be adopting mobile technology as a delivery model for library services to serve todays' users. Some of the reasons mentioned by the participants were as follows:

*"Todays' users are techno-savvy and dependable on their mobile phones. Libraries should now go where users are", s*aid PLDUT1

"Mobile technology provides seamless access to academic resources and it only make sense for libraries to provide services that can be accessed via mobile devices", said PLMUT5

These days, mobile technologies allow engagements with librarians for reference queries. So, we have something called the LibChat that allows users to engage with librarians remotely using mobile devices and users can ask questions without coming to the library while accessing online resources such as books, journals and newspapers from their homes", said PLDUT3

"To remain relevant to today's users, we should be moving our services to be accessible via mobile technologies and our libraries should be taking this trend serious", said PLMUT2

"Mobile technologies make it easier for students and our lecturers to engage with us as librarians. It is effective and convenience for both the users and librarians and we should be considering these practices to serve todays' users", said PLDUT6

4.3.17 Mobile technology affecting/improving librarians services

Participants were asked to share their opinions if providing services that are accessible via mobile technology had improved or affected the way they executed

their daily duties. Judging from the participants' responses, mobile technology was found to be useful, and it has been seen as a positive change to the academic libraries. As the According to participants, mobile technology had improved their services and in addition reduced workloads in the following ways:

"I am now experiencing a low number of walk-ins to my office as students can now access some of our services via mobile devices. As a result, We are no longer dealing with congested offices due to assignments and project-related support", said PLDUT2

"Mobile technology is contributing to minimal face-to-face information literacy sessions and group consultations for assignments and research support. These consultations are now taking place online via MS Teams". said PLMUT3.

As librarians we are becoming more techno-savvy and starting to use the technology ourselves", said PLDUT3

"It is allowing flexibility for librarians to multitask", said PLMUT5

"More students are now using the library LibChat service to communicate since it is mobile friendly", said PLDUT4

*"my library is affected in a positive way. Users can now read newspapers and magazines from their personal smartphones without coming to read the print newspapers", s*aid PLMUT3

4.3.18 Services no longer provided due to the adoption of mobile technology

The researcher asked participants to indicate if there are services that were no longer performed by librarians due to the introduction of mobile services. About 54.5% (6 out of 11) of participants indicated that mobile technology has not completely replaced the traditional services, but rather enhanced and provided online options to most of the services. From the responses of the six participants, mobile technology is found to be useful in enabling library mobile services such as using the library catalogue, booking online information literacy sessions, checking borrowed items' status, and renewing them by using a mobile application (Bookmyne), and downloading eBooks and journal articles on mobile devices, as

well as gaining access to past exam papers, magazines, and newspapers. This is directly linked to the UTAUT's construct, Performance expectancy.

Four (36.3%) of the participants indicated that some of the services were no longer offered face-to-face as they could be accessed via mobile technology:

"I don't have to struggle with making booking for bigger training rooms and computer laboratories, as students are now attending information sessions via their mobile devices. Venues use to be a challenge when you have bigger IL classes", said PLDUT5

"We no longer have to printing library research guides for users, instead, we direct them to access the guide on the webpage using their mobile smart devices", said PLDUT2

"In my library students I'm no longer printing out booking timetables on notice boards. Online booking links are used for IL sessions", said PLDUT3

" I'm no longer providing majority of my consultations in the offices because students can now contact me using library online chat service from anywhere using their Cellphones", said PLDUT6.

COVID-19 was identified as another social factor that encouraged academic librarians to provide more mobile services and virtual support to their library patrons. The following were mentioned as some of the changes brought about by the use of mobile technology as a result of the current COVID-19 pandemic:

- Delivery of library information literacy training

The majority of the academic librarians, 72.7% (8 out of 11), confirmed that training is no longer 100% face-to-face. Librarians are now providing training online via MS Teams and Moodle. Training registers are now done online and no longer manually. Students can access training via mobile devices remotely. Librarians are now making recordings of their training sessions available to students.

- Collection development

Change in the online system to order books using online systems that allow access via mobile devices such as laptops, smartphones and tablets. The focus is now on electronic books and journals.

- Cost-saving

Students do not have to travel to campus to access library resources. They can use the university Wi-Fi and data provided to access information from their mobile devices.

4.3.19 How easy is it for librarians to adopt and use MT for library services? (Required efforts)

The researcher asked participants to indicate how easy it is to use, market and communicate services accessible via mobile technology. This question was also asked to determine if there were any efforts required from the participants in the process of adopting and using mobile technology for library services. About 90.9% (10 out of 11) of the participants indicated that they found it easy to market and communicate services accessible via mobile technology with users.

In this study, only 9% (1 out of 11) of participants reported that they found it difficult at first. Some of the issues were lack of knowledge and the need to consult other librarians to learn more about how to provide services using mobile devices. According to the participant, they are still finding it difficult to promote mobile services that are accessible via mobile devices and have requested help from a line manager on the marketing strategies to be used.

Table 4.6 lists some of the reasons provided by participants showing that some academic librarians required very little help on using mobile technology, as users were already accessing some of the library mobile services using their mobile devices. Some academic librarians indicated that some efforts were required for them to engage on mobile services at their libraries as they relied on fellow colleagues for support on how to use mobile technology to promote and adopt mobile technology as a delivery model for library services. Some participants also mentioned that for them to encourage students to use the online LibChat and Ask A Librarian service, they needed to conduct more sessions and also include such

details in their formal and informal information literacy sessions held with students in their faculties.

Table 4.6: Responses from participants about using mobile technology to market and promote library services

*"I find it easy to market and communicate these services; students were already asking about accessing resources such as past exam papers, e-Books, and library OPAC via cell phones. However, the library should put together a marketing strategic plan in this Regard", s*aid PLMUT2
" It's easy to use and promote but one needed to understand the students' needs and to also consider the different types of users served by the library", said PLMUT4
"It was not easy in the beginning because I needed help from colleagues. Now it's much easier because I am techno-savvy", said PLDUT4
"Collaborating with lectures in my faculty assisted a lot as students were now using their mobile devices to access faculty content and library resources via the library research guide links", said PLMUT5
"I found it very easy for me but had to take into consideration the challenges experienced by users, especially students from disadvantaged backgrounds. The digital divide is still a challenge", said PLDUT1
"Easy, I used social media, email, library research guides and my WhatsApp to communicate services accessible via mobile phones and tablets. Many students and lecturers are using their phones to access emails", Said PLDUT5
"It was not easy at first because of the digital divide. Some users needed extra help. The

library should also organise a marketing plan for mobile services", said PLMUT1
"Easy for me as students are familiar with mobile services. Most of our students loved the new mobile application, Bookmyne. It was easy to even promote the electronic newspapers at the faculty board meetings with academics", said PLDUT6

4.3.20 Knowledge about mobile technology

This section focuses on finding out if participants have efficient knowledge regarding the use of mobile technology to deliver library services. Participants were classified into three levels of understandings: high, medium, and low level of understanding. Participants were placed into a particular category based on several examples provided when indicating the knowledge and skills activities they have engaged in encouraging the use of mobile technology to access library services. The details of the levels of understanding and knowledge are discussed next.

- High level of understanding

As suggested by Adams *et al.* (2018: 756), a person with a high level of understanding has a deep understanding and good knowledge of the subject matter or concept. A majority of participants, 54.5% (6 out of 11) indicated a high level of understanding of how to market, promote, and deliver library services accessible via mobile technologies. Some of the examples mentioned by participants included showing students how to access the library live chat feature via cell phones to enquire with library staff; directing users to access the online catalogue from mobile smartphones; reminding students to access email communication via mobile devices; directing users to the mobile application Bookmyne; use of Mobile application Mobizen to deliver IL sessions from a cell phone; directing users to eBook platforms accessible via mobile devices; showing users how to create login details to download eBooks into laptops and tablets; using of Ms teams to conduct IL sessions; sharing links of electronic resources via students and lectures WhatsApp groups; showing students how to complete library IL assessments using cell phones; directing users to compete for short library

surveys via cell phones and other gadgets, and directing students to access library service videos via mobile devices.

This section confirms that behavioural intentions were significantly and positively influenced by understanding and knowing how to use mobile devices to provide library services. Again, this is in line with the applied theoretical framework, UTAUT, in determining the behavioural intentions to adopt mobile technology as a delivery model for library services.

- Medium level of understanding

Adams *et al.* (2018: 758) suggest that a person with a medium or middle level of understanding is someone who has general knowledge about the subject matter or concept. This person normally lacks the expertise knowledge. About 27.2% (3 out of 11) of the participants indicated that they had some understanding and knowledge. However, participants also wished to learn more from management and colleagues. When prompted to explain further, some of the participants mentioned that their knowledge was limited to showing students how to access the library web page using mobile devices, using the mobile application Bookmyne, and accessing the library catalogue. Again, this group was also regarded as having a medium level of understanding purely based on several examples provided. One of these participants also indicated that further training was required to gain more knowledge about the use of mobile technologies to provide library services. When asked if they received any training aimed at helping them to better understand the use of mobile technology to provide and support library services, the participants who were categorised under this level indicated the following:

*"As I have indicated that I have basic knowledge and understanding of how to use these mobile technologies for library services, but I think since I have started in this new portfolio, I need intense training", s*aid PLDUT2.

*"I have received some support especially my line manager who likes to see the library users using the library mobile application, Bookmyne. But regarding the training now there hasn't been any formal training that I've received, that's why I think we need to up ourselves a bit as librarians so that we are on par with our users", s*aid PLMUT1.

"Yes, the institution does provide training through the skills and working with our suppliers they always try and upskill us in terms of the technology and the latest technology and how we can use mobile devices um but also there's also room for improvement. I think management can also offer us better training, for instance, maybe once a month, we can learn about a new app that we can use to interact with our students", said PLDUT3.

- Low level of understanding

About 18.1% (2 out of 11)) participants were categorised as having a low level of understanding based on the number of examples provided as well as further reasons provided by them when asked about their knowledge in this regard. This group mentioned that they required further training and support from both library management and the institution. Two examples were mentioned as providing access to the catalogue and contacting library staff via the library webpage. One participant, P L M U T 2 said, "*When we were given the task to create some pieces of training that can be accessed via mobile devices, I couldn't do it easily and it took some help from colleagues for me to complete the exercise. I then realised that there are many of the things which I need to get more information about regarding mobile technology" .* When asked if they received any training aimed at helping them to better understand the use of mobile technology to provide and support library services, the participants who were categorised under this level indicated the following:

"No training support received from management as yet", said PLDUT4

"I only had a few sessions with colleagues when needing help with making short videos for students. However, I still need to learn a lot", said PLMUT1

4.3.21 Availability of support and training to help better the understanding of mobile technology

Participants were asked to indicate if they received any support or training aimed at helping them to better understand the use of mobile technology to provide library services. Eight (8) participants (72.7%) indicated that they received formal and informal support and training from colleagues.

“I have personally received support from my line manager in this regard. I asked to attend a social media workshop and I was granted permission to attend and also asked to write a report about the workshop on how it will benefit the library”, said PLDUT2.

"*Yes, we have received the support. The support was from my colleagues and staff from the IT section when I need help with using short survey for students to access on their mobile devices*”, said PLDUT3

Also, 18.1% (2 out of 11) of the participants indicated that they received informal support from their line managers. Only 1 person indicated that they had never received any kind of support and the knowledge acquired was based on self-learning and following the global trends. “*I have never received any sort of training, and hopefully our line manager will consider that. I have been learning from fellow colleagues and not necessarily from a formal organised session or training from our line manager*”, said PLMUT4

4.3.22 Are libraries doing enough to move towards mobile technology?

The purpose of this section was to determine whether or not libraries are doing enough to make services mobile-friendly. According to the majority of the participants, 81.8% (9 out of 11), libraries are providing enough mobile-friendly services. Participants cited examples of services such as OPAC searches, Bookmyne applications, Live Chat, e- Books, newspapers and Journal articles downloadable from mobile devices as examples of libraries' efforts to embrace mobile technology. Only 2 (18.1%) of participants felt that their libraries are not doing enough and that aggressive or rather strategic marketing plans should be developed to increase communication and promotion of these services with library users.

4.3.23 Readiness of libraries to adopt mobile technology

The researcher also used this section to find out the opinions of all participants regarding their libraries’ readiness to fully adopt mobile technology as a delivery model. From the responses of the research participants, it seems that academic librarians felt that their libraries were not ready to fully adopt mobile technology as a delivery model. The researcher used these responses to confirm that some

efforts are indeed required for libraries to fully adopt mobile technology as a delivery model for library services. The term “fully adopt” was described as a library that is ready to have a majority of its services accessible via mobile devices. A majority of participants, 72.2% (8 out of 11) argued that their libraries were not ready to fully adopt mobile technology as a delivery model.

Some of the reasons provided by participants include lack of proper infrastructure, lack of full support from library management, lack of policy guidelines to guide both users and librarians on the use of mobile devices to access library resources, poor network support and bandwidth, as well as poor marketing strategies regarding services accessible via mobile technologies.

“*We have not yet reached a stage where we can say we are fully ready to offer a majority of our services via mobile technologies”,* said PLMUT3

Only 3 (27.2%) of the participants felt that their libraries were ready to fully adopt mobile technology as a delivery model for library services. Some of the comments provided by participants are indicated below:

“Although the library is ready, not sure if all users are ready to access everything from their mobile devices”, said PLDUT1

“Yes, we are ready but the marketing strategy needs to be developed to make sure all users understand how these services can be accessed”, said PLMUT5

“The library is ready but not to deliver all of these services online as there is a fair number of services that cannot be accessed via mobile phones and other gadgets”, said PLDUT6

4.3.24 Survey feedback about the technology from users

Under this section, participants were asked to indicate if their libraries had conducted surveys to determine if users (especially students) had devices capable of accessing library services online. About 90.9% (10 out of 11) of the participants indicated that they were not aware of any survey done in their libraries to determine if users had mobile devices capable of accessing library services online. One participant mentioned that one survey was done by the institution a while back. However, the participant was not sure if the results were shared with the rest of the university community.

4.3.25 Factors pushing librarians to move towards Mobile technology

This sub section was used to determine the facilitating conditions that may be contributing to the adoption of mobile technology. As stated by Khlaif (2018: 52), "*Facilitating conditions can be thought of as the degree to which an individual believes there is sufficient organizational infrastructure, resources, technical infrastructure, and technical support to support the use of mobile technology".*

Participants were asked to share if there were conditions or factors pushing the library toward adopting mobile technology to deliver library services. All participants (11) indicated that the current COVID-19 pandemic has increased the usage and reliability of mobile devices by both academic librarians and students. As a result, there was a level of change in the way they performed their daily duties and not necessarily that there are services that were no longer provided due to the availability and usage of mobile technology to provide library services. "COVID-19 is a disease caused by a new coronavirus, which has not been previously identified in humans. In most cases, COVID-19 causes mild symptoms including dry cough, tiredness and fever, although fever may not be a symptom for some older people" (WHO 2021: Para 1, Line 2). Clearly, this disease has affected many businesses and institutions including libraries. Many libraries are either closed or operating for limited hours with limited staff offering limited services, while users were encouraged to access services remotely (Shirley, Mawire and Baloyi-Sekese 2020: 207; Rafiq *et al.* 2021: 2). About 10 (90.9%) of the participants mentioned the fact that globally, mobile technology is making quick and easy access to information and services, and libraries are also taking advantage of these developments.

One participant also mentioned examples of activities such as online shopping and online banking as some of the services students engage daily using mobile technology, hence librarians felt it was important to make some of the library services accessible via mobile devices.

Four (4) of the participants (36.3%) also mentioned that the current 4IR and further development of Information Communication Technology (ICT) is also contributing to the trend of adopting mobile technology for various services globally.

4.3.26 Barrier affecting the adoption of MT

Table 4.7: Barriers hindering the adoption of mobile technology

Barriers	Number of participants
Network infrastructures, and small library budget	90.9% (10 out of 11)
Lack of proper marketing strategies	72% (8 out of 11)
Lack of data	63% (7 out of 11)
Users are not embracing the use of mobile devices to access library services	45.4% (5 out of 11)
Technophobia and digital divide/computer illiterate	45.4% (5 out of 11)
Small budget and low bandwidth	27.2% (3 out of 11)
Lack of knowledge on the use of mobile technology	18.1% (2 out of 11)
Lack of tablets and smartphones/devices	18.1% (2 out of 11)
Difficulty to access digital resources on mobile phones	9% (1 out of 11)

This section was used to solicit data on the possible barriers that could be affecting or hindering the adoption of mobile technology at the UOTs in KwaZulu-Natal. The majority, 90.9% (10 out of 11) of participants mentioned poor network structures and lack of data as the biggest challenges contributing to the low adoption of mobile technology by students. Table 4.7 shows the different barriers and the number of participants who mention such barriers. The barriers are arranged from highest to lowest.

A free online tool called Wordsift was also used to create a Wordcloud from the data collected. Figure 4.7 shows the common themes identified as barriers contributing towards the hindering of mobile technology in academic libraries.

Figure 4.7: Common themes (barriers contributing towards hindering the adoption of mobile technology)

4.3.27 Recommendations and solutions towards addressing the barriers

About 54.5% (6 out of 11) of the participants indicated that some of those challenges affecting libraries in adopting mobile technology were not necessarily library issues but institutional ones. Examples mentioned by the participants include lack of data for some users, lack of Wi-Fi in university residential areas, and poor connectivity to network in many of the community areas. The above-mentioned issues were identified under section 4.3.26. Some of the solutions provided by some of the participants were as follows:

- Data

"*The government and universities to provide more data to students for study purposes*", said PLMUT2.

"*Provide an intranet service point that can be accessed using less or no data at all*", said PLMUT4

- Marketing

"*Libraries should invest and develop marketing strategies for such services*", said PLDUT4.

"*Provide an intranet service point to allow users to check FAQs related to resetting university email and login passwords, reduce the number of options to click before accessing what you need*", said PLDUT1.

"*Introduce more training sessions for library users to use cell phones to access mobile services. Libraries should benchmark with other institutions*", said PLMUT3.

- Network

"*Library managers need to work with the IT departments to sort out network bandwidth and connectivity problems*", said PLDUT5.

- Digital divide and demographics of library users

"*Introduce learning centres to assist first-year students coming from disadvantaged backgrounds. Introduce learning lessons for new technology to both academic librarians, students and other university communities",* said PLMUT5.

"*Introduce more training sessions for students to use cell phones and other smart devices to access mobile library services*", said PLMUT2.

"*Government has to intervene with proper network structures in rural areas*", said PLDUT6.

- Lack of smartphones and mobile devices capable of accessing library services

"*Universities should continue providing needy students with mobile devices, these has been helpful for students coming from previously disadvantaged backgrounds",* said PLMUT1

"*Government should continue to assist universities in providing gadgets to needy students at universities*", said PLDUT2.

4.3.28 Support provided within the institution

Under this section, the researcher analysed data about the availability of support from within the university. Participants were asked to indicate the various support

provided by their libraries or within their institution. Table 4.8 shows various support and services provided by various sections that participants felt encouraged the adoption of mobile technology within the institutions.

Table 4.8: Support and services encouraging mobile technology adoption

Department/Section	Support/Service provided
Subject Librarians	• Librarians created support materials in the form of library guides (known as Libguides). This includes videos, presentations, and tutorials. Links are shared with users to access via mobile devices. • Showcases students and staff how to access electronic resources such as e-Books and e-Journals via mobile devices. • 45.4% (5 out of 11) Librarians indicated their library purchased a mobile application called Bookmyne.
IT department	• Provide technical support such as Wi-Fi connectivity, connecting to mobile printing, and resetting email and portal login details.
Roaming IT support for students	• Provide mobile Wi-Fi connectivity, mobile printing, resetting email passwords on mobile devices (mainly smartphones and laptop) for students.
Centre for Excellence in Learning and Teaching (CELT at DUT) and ICT section and the Language Centre at MUT	• Provide university staff and students with technology for learning support such as access to multi-modal learning tools via mobile devices. Tools and applications such as MS Teams, Zoom and Moodle.
After-hours service	• Provide professional services in the evening and during the weekends. Showcase students and staff how to access electronic resources such as e-Books and e-Journals via mobile devices and

	downloading a library mobile application called Bookmyne to students and staff.
Library Managers	• Some managers are encouraging subject librarians to use mobile teaching applications such as Mobizen.
Writing Centres	• Encourages the use of mobile devices to book appointments for consultations. Booking links are now made available via the writing centre online page.

4.4 ACHIEVEMENT OF THE STUDY OBJECTIVES

As planned, the researcher linked the study objectives with the critical questions of the study as laid out in Chapter Two, intending to achieve the study purpose. The achievement of the objectives below also confirmed the achievement of critical questions as the critical questions were directly linked to the objectives of the study.

4.4.1 Objective 1: To determine the social influences contributing to the behavioural intentions to adopt mobile technology

This objective was achieved as participants indicated that library managers are encouraging the adoption of mobile technology. Participants indicated that library managers and directors facilitate the provision of laptops for staff and encourage staff to use mobile applications such as Mobizen and Bookmyne. As indicated in Section 4.3.8, the majority of participants, 63.6% (7 out of 11) responded that library managers encouraged them by providing laptops and mobile applications. Under Section 4.3.9, participants also indicated that users were also playing a role in encouraging academic librarians to adopt mobile technology by enquiring about services accessible via mobile devices. As confirmed by Kim, Yi and Hong (2020: 10); Williams, Saunderson and Dhoest (2021a: 81), students are responding positively to the adoption of mobile technology to access library services. Singh and Nikandia (2017: 165) also hinted that since many people are now highly dependent on their mobile phones, there might be an increase in

students to expect libraries to deliver more services via mobile technology. The comments by participants as added in Table 4.2 under Section 4.3.8 also show that academic librarians are encouraging each other to adopt MT to deliver library services. Other social factors mentioned under section 4.3.10 were the continuous growth of ICT and 4IR, COVID-19 pandemic, and the need to keep up with the current trends in libraries and these examples were very crucial in helping to answer a critical question related to this objective.

4.4.2 Objective 2: To determine the perceptions of academic librarians on the usefulness of mobile technology in delivering library services

This objective was achieved under Section 4.3.14 as participants confirmed the usefulness of mobile technology as they found it easy to use. Furthermore, the technology has made some positive changes, as shown in Sections 4.3.14 and section 4.3.17, librarians are able to deliver services such as information literacy, collection development, access to e-Books, e-Journals, newspapers, past exam papers, and many more services accessible via mobile devices.

The questions used to determine the usefulness of mobile technology were of personal interest to the researcher as some of the existing literature argues that only a few academic libraries are taking advantage of mobile technology to deliver library services (Saravani and Haddow 2017: 132; Panahi, Roostaei and Nemati-Anaraki 2021: 15). All participants (100%) as indicated in Section 4.3.15 confirmed that mobile technology was highly useful in delivering library services, and also agreed that academic libraries should be adopting or moving towards providing a majority of the services accessible via mobile devices wherever possible. The questions used in this section were also directly linked to the UTAUT construct, known as Performance Expectancy, that deals with the usefulness of technologies Some of the reasons provided by participants are listed below:

- *For convenience and effectiveness (PLDUT4)*
- *Allows for remote access for both users and librarians (PLDUT6)*
- *Assist in reducing considerable numbers inside the library as services can be accessed via mobile devices outside the library (PLMUT3)*

- *Academic libraries should not only adopt mobile technology as a delivery model but also provide training on how to access and use it effectively (PLMUT1)*
- *Because it provides seamless access to library academic resources (PLMUT5)*
- *It allows engagements with librarians for reference queries using new online tools such as live chat via the library page (PLDUT1)*
- *It's where our users are, if you want to remain relevant to today's users, we need to occupy that space we need to go where the user is and that's through mobile technology(PLDUT2)*

These reasons shared by the participants were backed up by the current literature. Mobile technologies are now considered a necessity and vital aspect of today's learning and access to information and services (Rafique *et al.* 2020: 1). Elahi, Islam and Begum (2018: 38) suggest that the use of mobile devices has become an important part of success not only in education but providing easy and quick access to information from anywhere.

4.4.3 Objective 3: To determine the efforts required to successfully adopt mobile technology as a delivery model for library services

This objective aimed to determine if there are efforts required to successfully adopt mobile technology in academic libraries. was achieved. The majority of the participants, 72.7% (8 out of 11), under section 4.3.19 indicated that they found it easy to use, market and promote services that are accessible via mobile technologies. Participants who found it easy to use, market and promote mobile services, were able to provide services such as access to eBooks, eNewspapers, eJournals and access to the library catalogue known as the Online Public Access Catalogue (OPAC) via mobile devices. However, a few participants, 27.2% (3 out of 11) indicated that they battled at first to adopt to the methods used to provide, market and promote mobile services. Digital divide was mentioned under this section as one of the factors contributing to increasing the efforts required to successfully adopt mobile technology as a delivery model for library mobile services.

Some participants also indicated that they dedicated time to engage on collaboration with faculties to encourage users to use their mobile devices to access faculty content and library resources. The WhatsApp application has been used to communicate with users, and students are now using phones to consult librarians. However, some of the librarians indicated that for them to successfully adopt mobile technology, efforts to understand user needs, understanding user dynamics such as capabilities and support (especially users from disadvantaged backgrounds), needed to be taken into considerations when engaging in the process. Additionally, two participants mentioned that in order for users to engage with librarians using the online LibChat and Ask a Librarian services, librarians needed to include this information in their information literacy sessions to encourage users to use the online LibChat service via mobile devices.

As indicated in Section 4.3.20, some of the participants also confirmed that as much as they were knowledgeable about the use of mobile technology for library services, they felt that some efforts were required to adopt mobile technology fully or successfully. Some of the participants felt that for one to successfully adopt mobile technology in their libraries, some efforts were required to provide continuous learning, special training, consultations with fellow librarians and support from library managers.

Under Section 4.3.22, the majority of the participants indicated that their libraries were doing enough as they were offering mobile-friendly services. Under this section, a small percentage of participants indicated that librarians were not doing enough. Poor marketing was mentioned as a key issue to be addressed. A study by Mawere and Sai (2018: 6) also argues that awareness and lack of aggressive marketing by librarians have been seen as some of the challenges contributing to the low usage of some of the mobile services offered by university or academic libraries.

Some participants also indicated that library strategic plans and marketing plans are required to successfully manage and promote the use of mobile technology for library services. Waral (2020: 2) argues that mobile technology provides an opportunity for academic libraries to provide access to information services in a much effective and quicker way to the user. The new technology requires

academic librarians to move towards adopting new online marketing strategies for library services and resources (AlAwadhi and Al-Daihani 2019: 228). Therefore, academic libraries have to move with the current time and invest in innovative marketing strategies suited to their environment and users to make a positive impact with services accessible via mobile devices.

The current literature suggests that students in academic institutions have access to smartphones and other mobile devices (Wai *et al.* 2018: 1; Poláková and Klímová 2019: 1; Baldwin and Ching 2020: 413; Ocran, Underwood and Arthur 2020: 2). As suggested by Lau *et al.* (2020: 2), academic librarians in universities should be conducting formal surveys to find out about students' use of mobile devices. Section

4.3.24 confirms that academic librarians in the UOTs in KwaZulu-Natal have not conducted such surveys to determine if students have these mobile devices and if they are indeed using these mobile devices to access library services. Under Section 4.3.21, participants also confirms that they have used some support in their departments while engaging the process of adopting mobile technologies to deliver library services. Some participants also mentioned that support was received from fellow colleagues as well as from other departments withing their institutions.

4.4.4 Objective 4: To determine the facilitating conditions towards the adoption of mobile technology

Under this objective, the purpose was to determine the various facilitating conditions that may be contributing to the adoption of mobile technology by academic libraries in the UOTs in KwaZulu-Natal. Participants were asked if there were factors that may be pushing them to adopt or move towards using mobile services . This section comprises four main questions carefully designed to collect data from participants to achieve this objective.

This objective was achieved as stipulated in Section 4.3.25 where factors pushing libraries to adopt mobile technology for library services were discussed. The current COVID-19 pandemic, the global library trends, and the 4IR evolution were

mentioned by participants as some of the facilitating conditions that accelerated their libraries to adopt services accessible via mobile devices.

In addition, Section 4.3.28 detailed the services and support provided by various sections within institutions. Participants provided these examples as some of the services that are encouraging the behavioural intention to adopt mobile technology by both users and academic librarians.

AlAwadhi and Al-Daihani (2019: 229) argue that collaborating with other university student support stakeholders can assist libraries in their quest to encourage students to use mobile devices for learning. As confirmed by Aithal and Aithal (2020: 9); Wei *et al.* (2021: 623), these mobile technologies are favourable to the generation currently served by universities that have the habit of using mobile devices to access information, communicating, playing online games, conducting online shopping and banking daily.

4.5 CHAPTER SUMMARY

In this chapter, the researcher begins by presenting the biographical details of the participants, followed by an analysis of the qualitative data collected. The purpose of this chapter was to assess the social influences, the usefulness of mobile technology, the efforts necessary to adopt mobile technology, and the facilitating conditions encouraging the behavioural intentions to adopt mobile technology in academic libraries.

By determining the social influences, the researcher established that library managers and users were encouraging the adoption of mobile technology in libraries. Most participants reported that their library managers provided library staff with laptops and encouraged them to use mobile devices to access and provide some library services. In addition, library users were playing a part in fostering mobile device adoption. This chapter further discusses the type of users who are enquiring about services accessible via mobile devices.

The study also analysed the usefulness of mobile technologies, as it determined that a majority of participants felt that these technologies were useful: they were making their lives easier. The researcher also discussed the effort necessary to adopt mobile technology, with the majority of participants confirming that there

was not much effort required to provide library services with the mentioned technologies.

The chapter also discussed the COVID-19 pandemic, library trends, and the constant development and demand for ICT skills by academic libraries in KwaZulu-Natal as some of the facilitating conditions that contribute to the behavioural intention to adopt mobile technology to provide library services. The critical questions and objectives were answered in this section. The next chapter will discuss the key findings of the study in relation to the study's objectives, purpose and aim

5 CHAPTER FIVE: SUMMARY OF KEY FINDINGS

5.1. INTRODUCTION

The study key findings are discussed in this chapter. These findings are also aligned to the objectives, critical questions and the theoretical framework applied in the study. This section provided the summary of the key findings in the study as the finer details of the findings are presented in chapter 4, under the presentation of interpretive data.

5.2. KEY FINDINGS

The researcher aimed to explore the various social influences on the behavioural intention to adopt mobile technology as a delivery model for library service. This is in line with the UTAUT theoretical framework. As confirmed by Tak and Panwar (2017: 249) UTAUT supports research that deals with exploring the behavioural intention to adopt or use technology, as discussed in Chapter Two of the study.

From section 4.3.8 up to section 4.3.10, the study found that internal factors such as libraries managers' encouragement, and adherence to best practices for providing services to today's users were other social influences that encouraged some of the academic librarians to adopt mobile technology. Furthermore, the study also found that library users are influencing librarians to change their traditional ways of providing services to shift towards delivering mobile services. As a consequence of the Fourth Industrial Revolution (4IR), the rapid growth of ICT, and the current pandemic of COVID-19, academic librarians are increasingly interested in using mobile technology as a delivery model for library services. According to most participants, the COVID-19 pandemic is currently the biggest reason libraries and librarians are adopting more mobile services for users to access library services remotely from mobile devices.

The study under Section 4.3.13 also found that librarians in the UOTs have no guidelines or policies in place that regulate or guide how mobile technology should be used to access resources. According to Huffman,

Shaw and Lovless (2019: 91), many colleges and universities in Europe and America have adopted mobile technology policies such as Bring-Your- Own-Device policy (BYOD) and Institutionally Provided Device policy (IPD) to address ethical and equity concerns. Such policies can be used to educate and protect users from deceptive content and fake news content.

The study revealed that academic librarians find mobile technologies very useful in providing access to Open Public Access catalogue, electronic books and journals, and online newspapers. Additionally, the study found that mobile technology allowed academic librarians to provide services and training remotely, thus making their lives easier.

The use of mobile devices for the library information literacy sessions has substantially reduced the students' fear of contacting COVID-19, allowing easier access to online consultation through tools such as LibChat, WhatsApp, and Ask A Librarian. Under section 4.3.17, the study finds that academic librarians are now arranging for Information literacy sessions to take place via MS Teams, Blackboard and Moodle. Mobile services have also brought some positive changes in the collection development process. Participants indicated academics can now place book orders online using mobile devices as an alternative option. The study also found that libraries have introduced a mobile application called Bookmyne to allow users to view their borrowed items status, and to access the library catalogue using their mobile devices without physically visiting the library.

According to responses discussed in section 4.3.19, academic librarians believe that in order for their libraries to fully adopt mobile technology as a delivery model, they will need to change and improve their marketing strategies, which is currently a huge issue. Moreover, the study by Harlow and Hill (2020: 200) confirms that marketing and outreach about services accessible through mobile devices is especially critical for online users, who may lack access to library materials and rely on online resources for research and assignments. For librarians adopting mobile technology, Vongjaturapat (2018: 41) suggests developing a marketing plan to promote and publicize the services accessible through mobile devices.

The study found under section 4.3.20 that majority of academic librarians in the UOTs in KZN were knowledgeable about the use of mobile technologies. However, they also felt that some efforts were required to adopt mobile technology fully or successfully. Some of the participants felt that for one to successfully adopt mobile technology in their libraries, some efforts were required to provide continuous learning, special training, consultations with fellow librarians and support from library managers

The study found in section 4.3.21 that some academic librarians have received some support from their managers and colleagues. Nevertheless, most participants reported that their colleagues encouraged their adoption of mobile technology by expressing their support.

In Section 4.3.23, the study found that many academic librarians are ready to provide services accessible via mobile devices. Nevertheless, they also felt their libraries weren't ready to fully adopt mobile technology as a delivery model for library services. Majority of librarians agree that moving a majority of their library services to mobile applications is not feasible. Several academic librarians mentioned in this section that the library has different types of users to consider when making such decisions. The library should consider all types of users it serves before moving 100% to mobile services. Lack of appropriate infrastructure, lack of full support by some library managers, lack of policy guidelines to guide both users and librarians in the use of mobile devices to access library resources, poor network support and bandwidth, as well as poor marketing strategies regarding services accessible via mobile technology are some other reasons mentioned. Moorthy et al. (2019: 131) argue in a similar way that poor infrastructure, a lack of budget, and managers' inadequate understanding and support of mobile and digital libraries make mobile services difficult to adopt.

Under section 4.3.24, the study found that librarians in the UOTs in KwaZulu-Natal
have not conducted formal surveys to determine if students have mobile de vices to
access library services if they were using them to access library services.

Section 4.2.25 found that the global trend of using mobile technology as a result of the current Fourth Industrial Revolution (4IR), the current COVID-19 pandemic and the institutional pressure to move toward mobile services have also encouraged and pushed academic librarians towards adopting mobile technology in their libraries. Librarians indicated that they used WhatsApp communication with students and academics and this was not the case before the pandemic. The researcher noted that the above-mentioned examples were mentioned as both social and facilitating conditions by the participants.

Under section 4.3.26, the study found that librarians believed that some of the factors or challenges affecting the adoption of mobile technology were not specific to libraries but common to academic institutions in the region. Challenges such as lack of data for students and network connections were raised as high factors that may be hindering the adoption of mobile technology as a delivery model for libraries.

Finally, under section 4.3.28, the study found that academic librarians feel that the other support services departments such as the Information Technology (IT), the Writing Centre, and the Centre for Excellent Learning and Teaching are encouraging the behavioural intention of both students and staff within the university to adopt mobile technology. Examples of how these departments are encouraging the behavioural intention to adopt and use mobile devices are listed in Table 4.8. As confirmed by Okai-Ugbaje, Ardzejewska and Imran (2020: 3), departments such as IT and other student support service sections have been encouraging the use of mobile technology for learning in the higher institutions of learning.

5.3. CHAPTER SUMMARY

The chapter provided an overview of the study's key findings. The findings were aligned with the study's objectives, critical questions and the theoretical framework applied in the study. These key findings come primarily from the sections that identify the social factors that influence the adoption of mobile technology in academic libraries as well as the perceptions of academic librarians regarding the usefulness of mobile

technology to deliver mobile services, the perceptions of academic librarians regarding the effort required to adopt mobile technology, and finally, the perceptions of academic librarians regarding the facilitating conditions that contribute to the adoption of mobile technology. There were several factors and facilitating conditions that academic librarians believe were driving the adoption of mobile technology in academic libraries, including the support of library managers and users, the current COVID-19 pandemic, as well as current library trends.

6. CHAPTER SIX: CONCLUSIONS, RECOMMENDATIONS AND CONTRIBUTIONS OF THE STUDY

6.1. INTRODUCTION

The conclusion provides a concise summary that leaves the reader with a clear understanding of the main purpose of the study and the main discovery and arguments of the study (McCombes 2021). The researcher uses this chapter to connect the problem statement, the objectives of the study, and the key findings of the study. The recommendations based on the data analysed in the previous chapter are also presented and summarised. The researcher uses this chapter, finally, to discuss the contributions of the study to the Library and Information Studies (LIS) field.

6.2. RESTATED PROBLEM AND OBJECTIVES OF THE STUDY

This study sought to investigate the perceptions of academic librarians at KwaZulu- Natal's Universities of technology (UOTs) regarding the use of mobile technology in providing library services. This study was influenced by the literature that states academic librarians should be excelling in using mobile technologies for library service (Maideen 2017: 125; Baidyussenova and Manabat 2020: 42; Atkinson 2021: 11).

There are currently many studies exploring the views and perceptions of students at universities regarding the adoption of mobile technology, especially in Africa. This study will be one of the few studies focussing on exploring the views and perceptions of academic librarians in the universities of technology in the KwaZulu-Natal province. The UOTs were chosen for this study as literature suggest that they have a bigger role to play in addressing societal challenges using modern technology in their institutions (Miller 2019: 1682; Taebi, van den Hoven and Bird 2019: 1626).

The study followed the four research objectives that are presented in Chapter One. These objectives were crucial since they provided a focus for the entire

study. The study objectives were achieved as stipulated in Chapter Four of this study. The study objectives were as follows:

To determine the social influence aspects such as peer effect and user's influence on the behavioural intention to adopt mobile technology as a delivery model for library services by academic librarians in the UOTs in KwaZulu-Natal.

to determine the perceptions of academic librarians at the UOTs in KwaZulu-Natal on the usefulness of mobile technology as a delivery model for library services.

To determine the perceptions of academic librarians at the UOTs in KwaZulu-Natal on the efforts required to successfully adopt mobile technology as a delivery model for library services.

to determine the facilitating conditions that might be contributing to behavioural intentions for academic librarians at the UOTs in KwaZulu- Natal to adopt mobile technology to provide library services.

6.3. CONCLUSIONS

6.3.1. Social influences contributing to the behavioural intentions to adopt mobile technology

Chapter Four, section 4.3.8 up to section 4.3.10 discusses various social influences such as the need to adhere to global best practices, the encouragement and support by library managers, the ICT growth, the massive expansion of the ICT and the 4IR, in the library profession, student requests and inquiries about mobile services, as well as the peer support from fellow librarians as some of the factors encouraging the adoption of mobile technology by academic librarians. Generally, students are mostly interested in mobile services. Additionally, the literature reviewed in Chapter Two, Section 2.4, indicates how users, library managers, and fellow professional librarians are encouraging mobile technology adoption in academic libraries.

6.3.2. Perceptions of academic librarians on the usefulness of mobile technology as a delivery model for library services

It is demonstrated in Section 4.3.2 of Chapter Four, that academic librarians consider mobile technology to be very useful for delivering and enhancing library services. In Section 4.3.2, the study lists various advantages and benefits of using mobile technology. Furthermore, Chapter Two, Section 2.5 refers to literature studies which confirm that mobile technologies have helped academic librarians to offer successful mobile services and to remain relevant to today's information users.

6.3.3. Perceptions of academic librarians on the efforts required to adopt mobile technology

Chapter Four, Section 4.3.3 revealed a mixed response to this aspect, as some participants felt that no effort was necessary in order to adopt and integrate mobile technology in their libraries, while others felt there was minimal effort. Plans and strategies regarding marketing mobile technology to users were identified as some of the activities the librarians need to prepare in Section 4.3.3.

6.3.4. What are the facilitating conditions contributing to the behavioural intention to adopt mobile technology?

According to the study, under Chapter Four, Sections 4.3.4 and 4.3.25, there were several facilitating conditions for the adoption of mobile technology by academic librarians. Libraries were moving towards mobile services due to conditions such as current global trends, COVID-19, and training support. However, libraries are still prioritizing traditional services even as they move to provide services through mobile devices. The literature in Section 4.2.10 confirms that the current COVID-19 crisis and trends in the field of libraries, force them to adopt new technologies to provide seamless client services to today's users.

6.4. RECOMMENDATIONS

Based on the findings of this study and the conclusions drawn, the researcher suggests that academic libraries should consider the following recommendations:

- Information sharing and peer-to--to-peer sessions should be encouraged or formalised where possible, to allow more learning and skills sharing amongst librarians.
- Libraries should consider conducting more formal surveys to determine from users which services are most and least enjoyed to further develop or attend to challenges, if any.
- Librarians should create more marketing strategies and plans for each library on how this service will be supported and marketed.
- Road shows should be organised to educate both academic staff and students on the use of mobile devices to access library services.
- It is incumbent upon librarians to provide spaces and resources that support digitally disadvantaged patrons.
- There should be further collaboration with other support departments that provide virtual student support.
- Libraries need to invest in new technology resources that make it easier to access library services, resources, and other university services via mobile devices.
- To address the issues of bandwidth and network connectivity, the library should engage relevant university stakeholders for the benefit of students. Bandwidth and network connectivity were some of the issues confirmed by academic librarians as some of the challenges that may be hindering library users from using their mobile devices for library services.
- As technology keeps on changing, future studies should also consider covering exploring the perceptions of academic librarians in other UOTs, traditional universities, and colleges in RSA. Such research may also

assist in evaluating the technological changes and the continuous impact of mobile technology on the provision of library services.

- Future studies should also consider conducting comparative studies amongst the UOTs in South Africa to help identify gaps and common practices.
- Academic Librarians should lead the quest for the formulation of guidelines related to the use of mobile technology to access their institutional resources. Sharma and Madhusudhan (2017: 293) also suggest that management of universities and libraries should develop guidelines and policies towards the use of mobile technology, and these guidelines should be complemented by the development of more library mobile applications for delivering library mobile services.

6.5. CONTRIBUTIONS OF THE STUDY

This study adds to the current body of literature that exists regarding the perceptions of academic librarians on the use of mobile technology. This was an issue that forms part of the study's problem statement. Many researchers have sought to determine how students use mobile devices to access university and library services, yet very few studies have been conducted to ascertain how academic librarians, particularly university libraries in the UOTs, are managing this new trend in providing services to users today. The study also aims to close this gap between students' perceptions and professional librarians' perceptions on the use of mobile technology to provide library services, specifically in the UOTs in KwaZulu-Natal, SA.

This study has implications for the LIS field, since librarians can apply some of the lessons, challenges, and positives gleaned from academic libraries regarding their migration to using mobile technology to offer library services.

6.6. CONCLUSION

The development of information and communication technology is affecting the way libraries operate and provide services. As technology changes, library services, including those provided by academic librarians, are changing from

traditional services to mobile and virtual ones. Literature suggests that academic librarians must deploy these technologies to meet today's user needs and to remain relevant. Currently, most of the literature focuses on students' perceptions of the use of mobile technology for library services (Biswas, Roy and Roy 2020: 2; Yip *et al.* 2020: 389; Williams, Saunderson and Dhoest 2021b: 76; Zhang *et al.* 2021: 116).

This study was undertaken as an exploration of academic librarians' perceptions of the use of mobile technology to provide library services. Purposive sampling was performed to concentrate the study on the academic librarians employed to administer professional information services in two UOTs in KwaZulu-Natal. In the study, the objectives served as the main focus for the research, as critical questions were based on them. Both the objectives and critical questions were achieved, as presented in Chapter 4 of this study. This was made possible by how the questions were prepared to collect relevant and appropriate data from the participants, and how the research was conducted.

This study demonstrates the importance of librarians adopting mobile technology as a method for delivering library services. Nonetheless, it raises the issue of considering all types of users and their learning strategies and needs, infrastructure, and librarians' capabilities when moving towards mobile technology as a delivery model for library services. Library managers were viewed as encouraging the use of mobile technology to deliver library services. According to the study, academic librarians find mobile technology very useful since they can now provide resources and deliver services using mobile devices.

The study also identified several external factors such as COVID-19 and global ICT trends in libraries to have contributed to the behavioural intention of academic librarians in the UOTs to adopt mobile technology, as also suggested by Okike (2020: 2). In addition, some of the challenges including network connectivity, digital divide, lack of infrastructure, lack of data, as well as the lack of knowledge and skill of academic librarians, were identified as possible barriers hindering the adoption of mobile technology for library services. The study finally provides possible solutions to the challenges suggested by the

participants. To conclude, the study offered several recommendations for libraries in the adoption of mobile technologies, and for future research.

REFERENCES

Abata-Ebire, B. D., Okesanya, R. O., Abiodun, O. J. and Kusoro, A. 2019. Use of mobile technology for the provision of reference services in Nigeria University Libraries. *Library Philosophy and Practice,* 6: 1-13. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85072861211&partnerID=40&md5=678a4340734a3b9941729d9a3567af89 (Accessed 12 March 2020).

Abbas, Z., MacFarlane, A. and Robinson, L. 2017. Use of mobile technologies by law students in the law library: an exploratory study. *Legal Information Management*, 17 (3): 180-189.

Abdekhoda, M., Gholami, Z. and Zarea, V. 2018. Determinant factors in adopting mobile technology-based services by academic librarians. *DESIDOC Journal of Library and Information Technology*, 38 (4): 271-277.

Acheampong, E. 2019. Adoption and implementation of mobile technology-based library services in Ghanaian academic libraries. MPHIL, Department of Information Studies, University of Ghana. Available: http://ugspace.ug.edu.gh/handle/123456789/33186 (Accessed 20 June 2021).

Adams, V. M., Moon, K., Álvarez-Romero, J. G., Bodin, Ö., Spencer, M. and Blackman, D. 2018. Using multiple methods to understand the nature of relationships in social networks. *Society and Natural Resources*, 31 (7): 755-772.

Aharony, N. 2013. Librarians' attitudes towards mobile services. *ASLIB Journal of Information Management*, 65 (4): 358-375.

Ahenkorah-Marfo, M. and Akussah, H. 2016. Being where the users are: readiness of academic librarians to satisfy information needs of users through social media.

Library Revie, 65(8/9): 549-563. Available: https://www.emeraldinsight.com/doi/pdfplus/10.1108/LR-02-2016-0020 (Accessed 04 March 2020).

Ahmed, Z., Kader, A., Md Harun Ur, R. and Nurunnabi, M. 2017. User perception of mobile banking adoption: an integrated TTF-UTAUT model. *Journal of Internet Banking and Commerce*, 22 (3): 1-19.

Aithal, P. and Aithal, S. 2020. Conceptual analysis on higher education strategies for various tech-generations. *International Journal of Management, Technology, and Social Sciences (IJMTS)*, 5 (1): 335-351.

Akeriwa, M., Penzhorn, C. and Holmner, M. 2015. Using mobile technologies for social media based library services at the university of development studies library, Ghana. *Information Development*, 31 (3): 284-293.

Al-Ababneh, M. 2020. Linking ontology, epistemology and research methodology. *Science and Philosophy*, 8 (1): 75-91.

Al-Daihani, S. M., Almutairi, M. R., Alonaizi, R. and Mubarak, S. 2018. Perceptions toward academic library app implementation. *Information and Learning Science*, 119 (5/6): 330-341.

ALA. 2016. *Academic libraries*. Available: http://www.ala.org/educationcareers/libcareers/type/academic (Accessed 7 April 2021).

ALA. 2021. *Academic Libraries*. Available: http://www.ala.org/educationcareers/libcareers/type/academic (Accessed 19 May 2021).

Alajmi, M. A. and Alotaibi, J.H. 2020. Reconceptualization of system use in the context of the digital library: what are the roles of UTAUT and IS success models?,

Journal of Electronic Resources Librarianship, 32 (3): 151-181. Available: https://doi.org/10.1080/1941126X.2020.1790943 (Accessed 13 July 2021).

AlAwadhi, S. and Al-Daihani, S. M. 2019. Marketing academic library information services using social media. *Library Management*, 40 (34): 228-239.Available: https://doi.org/10.1108/LM-12-2017-0132 (Accessed 25 July 2021).

Alharahsheh, H. and Pius, A. 2020a. A review of key paradigms: positivism vs interpretivism. *Global Academic Journal of Humanities and Social Sciences*, 2 (3): 39-43.

Almaiah, M. A., Alamri, M. M. and Al-Rahmi, W. 2019. Applying the UTAUT model to explain the students' acceptance of mobile learning system in higher education. *IEEE Access*, 7: 174673-174686.

Ames, H. M., Glenton, C., Lewin, S., Tamrat, T., Akama, E. and Leon, N. 2019. Clients' perceptions and experiences of targeted digital communication accessible via mobile devices for reproductive, maternal, newborn, child, and adolescent health: a qualitative evidence synthesis. *Cochrane Database of Systematic Reviews*, (10). Available: https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013447/pdf/full (Accessed 25 June 2021).

Anderson, V. 2017. Criteria for evaluating qualitative research. *Human Resource Development Quarterly,* 28 (2): 1-9. Available: https://onlinelibrary.wiley.com/doi/10.1002/hrdq.21282 (Accessed 5 September 2021).

Andrews, J.E., Ward, H. and Yoon, J. 2021. UTAUT as a model for understanding intention to adopt AI and related technologies among librarians. *The Journal of Academic Librarianship*, *47*(6). Available:

https://www.sciencedirect.com/science/article/pii/S0099133321001282?via%3Dihub (Accessed 25 June 2021).

Anyim, W. O. 2020. Application of mobile technologies for access and retrieval of information in emergency situation: an eye opener for libraries and information users. *Journal of Computer Science and Technology Studies*, 2 (1): 26-32.

Arifin, S. R. M. 2018. Ethical considerations in qualitative study. *International Journal of Care Scholars*, 1 (2): 30-33.

Arigo, D., Pagoto, S., Carter-Harris, L., Lillie, S. E. and Nebeker, C. 2018. Using social media for health research: methodological and ethical considerations for recruitment and intervention delivery. *Digital health* 4.
Available: https://doi.org/10.1177/2055207618771757 (Accessed 21 May 2021).

Atkinson, J. 2021. Technology and change management in academic libraries: An overview and literature review. In: Atkinson, J. ed. *Technology, Change and the Academic Library*. Chandos , 11-32. Available: https://www.sciencedirect.com/science/article/pii/B9780128228074000026 (Accessed18 July 2021).

Bagui, L. and Mwapwele, S. D. 2019. Understanding Sub-Saharan African learners informal learning using mobile devices: a case of Tanzania. *African Journal of Information Systems*, 11 (2): 83-98.

Baidyussenova, G. and Manabat, A. 2020. Just a click away: the role of available mobile technologies at NU library. In: Proceedings of *Proceedings of the 9th Eurasian Academic Libraries Conference*. Eurasian Academic Libraries Conference, 41-49. Available: https://nur.nu.edu.kz/bitstream/handle/123456789/4998/Just%20a%20Click%20Away.pdf?sequence=1 (Accessed 28 July 2021).

Baldwin, S. J. and Ching, Y.-H. 2020. Guidelines for designing online courses for mobile devices. *Tech Trends*, 64 (3): 413-422.

Ball, R. 2019. Big data and their impact on libraries. *American Journal of Information Science and Technology*, 3 (1): 1-9.

Bansode, N. N. and Shinde, M. G. 2019. Impact of new technologies in the digital libraries. *Journal of Advancements in Library Sciences*, 6 (1): 279-283.

Barnsbee, L., Barnett, A. G., Halton, K. and Nghiem, S. 2018. Chapter 24 - Cost-effectiveness. In: Gregory, S. D., Stevens, M. C. and Fraser, J. F. eds. *Mechanical Circulatory and Respiratory Support*. Academic Press, 749-772. Available: https://www.sciencedirect.com/science/article/pii/B9780128104910000242 (Accessed 15 March 2021).

Bedi, S. and Walde, C. 2017. Transforming roles: Canadian academic librarians embedded in faculty research projects. 78(3). Available: https://crl.acrl.org/index.php/crl/article/view/16590/18036 (Accessed 25 July 2021).

Bernard, H. R. and Bernard, H. R. 2013. *Social research methods: Qualitative and quantitative approaches*. SAGE.

Bhatiasevi, V. 2016. An extended UTAUT model to explain the adoption of mobile banking. *Information Development*, 32 (4): 799-814.

Biswas, B., Roy, S. K. and Roy, F. 2020. Students' perception of Mobile learning during Covid-19 in Bangladesh: university student perspective. *Aquamedia,* 4 (2). Available: https://doi.org/10.29333/aquademia/8443 (Accessed 28 July 2021).

Blummer, B. and Kenton, J. 2019. Optimizing library services- academic libraries' mobile initiatives. *Against the Grain*, 29 (3): 60-61. Available: https://doi.org/10.7771/2380-176X.7804 (Accessed 10 January 2022).

Boddy, C. R. 2016. Sample size for qualitative research. *Qualitative Market Research: An International Journal,* 19 (4): 426–432. Available: https://psycnet.apa.org/record/2016-50346-003 (Accessed 20 July 2021).

Bolton-Palumbo, L. 2014. Mobile phones in Africa: opportunities and challenges for academic librarians. *New Library World*, 115 (3/4): 179-192.

Bozan, K., Parker, K. and Davey, B. 2016. A closer look at the social influence construct in the UTAUT Model: an institutional theory-based approach to investigate health IT adoption patterns of the elderly. *2016 49th Hawaii International Conference on System Sciences (HICSS)*. Koloa, 5-8 January. HI: IEEE, 3105-3114. Available: https://ieeexplore.ieee.org/document/7427574 (Accessed 20 August 2021).

Brittain, S., Ibbett, H., de Lange, E., Dorward, L., Hoyte, S., Marino, A., Milner-Gulland, E., Newth, J., Rakotonarivo, S. and Veríssimo, D. 2020. Ethical considerations when conservation research involves people. *Conservation Biology*, 34 (4): 925-933.

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D. and Walker, K. 2020. Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, 25 (8): 652-661.

Canuel, R. and Crichton, C. 2017. *Mobile technology and academic libraries: innovative services for research and learning*. Chicago: Association of College and Research Libraries.

Cao, G., Liang, M. and Li, X. 2018. How to make the library smart? The conceptualization of the smart library. *The Electronic Library* 36(5): 811-825. Available: https://www.emerald.com/insight/content/doi/10.1108/EL-11-2017-0248/full/pdf (Accessed 28 June 2021).

CET. 2020. What is the difference between a university, university of technology and FET college? Available: https://sastudy.co.za/article/what-is-the-difference-between-a-university-university-of-technology-and-fet-college-explained-2/ (Accessed 12 February 2020).

Chanetsa, B. and Ngulube, P. 2016. The changing roles, responsibilities and skills of subject and learning support librarians in the Southern African Customs Union region. *Journal of librarianship and information science*, 48 (2): 151-176.

Chang, C.C., 2013. Library mobile applications in university libraries. *Library Hi Tech*, 31 (3): 478-492. Available: https://www.emerald.com/insight/content/doi/10.1108/LHT-03-2013-0024/full/html (Accessed 23 Jan 2022).

Chaputula, A. H. and Mutula, S. 2018. Provision of library and information services through mobile phones in public university libraries in Malawi. *Global Knowledge, Memory and Communication*, 67 (1/2): 52-69.

Ciccone, A. and Hounslow, L. 2019. Re-envisioning the role of academic librarians for the digital learning environment: The case of UniSA Online. *Journal of University Teaching and Learning Practice*, 16 (1): 11.

Cilliers, L., Viljoen, K. L. A. and Chinyamurindi, W. T. 2018. A study on students' acceptance of mobile phone use to seek health information in South Africa. *Health Information Management Journal*, 47 (2): 59-69.

Corrall, S. 2015. Capturing the contribution of subject librarians applying strategy maps and balanced scorecards to liaison work. *Library management*, 36 (3): 223-234.

Cristobal, A. S. 2018. Expectations on library services, library quality (LibQual) dimension and library customer satisfaction: relationship to customer loyalty. *Library Philosophy and Practice (ejournal)*, 1706

Cuthbertson, L. M., Robb, Y. A. and Blair, S. 2020. Theory and application of research principles and philosophical underpinning for a study utilising interpretative phenomenological analysis. *Radiography*, 26 (2): e94-e102.

Cypress, B. S. 2017. Rigor or reliability and validity in qualitative research: Perspectives, strategies, reconceptualization, and recommendations. *Dimensions of critical care nursing*, 36 (4): 253-263.

Dabengwa, I. M., Raju, J. and Matingwina, T. 2019. Academic librarian's transition to blended librarianship: a phenomenology of selected academic librarians in Zimbabwe. *The Journal of Academic Librarianship*, 45 (4): 343-357.

Dania, P. O., Ewenode, I. and J. 2016. Undergraduate usage of mobile phones and its implication of school application. Journal of Education and Practice, 7 (21): 30-32.

De Kock, R. and Futcher, L. A. 2016. Mobile device usage in higher education institutions in South Africa. In: Proceedings of *2016 Information Security for South Africa (ISSA)*. IEEE, 27-34. Available: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7802925 (Accessed 15 June 2021).

DeJonckheere, M. and Vaughn, L. M. 2019. Semi structured interviewing in primary care research: a balance of relationship and rigour. *Family Medicine and Community Health*, 7 (2).

Delcker, J., Ifenthaler, D. and Honal, A. 2016. Mobile device usage in higher education. Paper presented at the *13th International Conference on Cognition and Exploratory Learning in Digital Age (CELDA 2016)* (Article). 01. 59-66. Available: https://files.eric.ed.gov/fulltext/ED571401.pdf (Accessed 19 June 2021).

Dewa, P. and Mutula, H. 2013. Mobile phone access and use among students at the National University of Technology (NUST) Bulawayo, Zimbabwe: implications for academic integrity. *Innovations* 4 (46): 150-165. Available: http://reference.sabinet.co.za/webx/access/electronic_journals/innovation/innovation_n46_a11.pdf (Accessed 8 March 2020).

Dold, C. J. 2016. Rethinking mobile learning in light of current theories and studies. *The Journal of Academic Librarianship*, 42 (6): 679-686.

Donmez-Turan, A. 2019. Does unified theory of acceptance and use of technology (UTAUT) reduce resistance and anxiety of individuals towards a new system? *Kybernetes,* 49 (5): 1381-1405. Available: https://doi.org/10.1108/K-08-2018-0450 (Accessed 21 October 2020).

Dorling, D. 2020. Hitting the population brakes. *Slowdown.* New haven: yale University. Available: https://newint.org/features/2020/04/07/long-read-hitting-population-brakes (Accessed 27 July 2021).

Dresselhaus, A. and Shrode, F. 2012. Mobile technologies and academics: do students use mobile technologies in their academic lives and are librarians ready to meet this challenge? *Information Technology and Libraries*, 31 (2): 82-101.

Du Pre, R. 2009. Nature and characteristics of South African UOTs. In: *Proceedings of second SATN Annual Conference 2009*. Belville, Cape Town, SATN, Available: https://thensa.co.za/wp-content/uploads/2020/05/REPORT-SATN-CONFERENCE-2009.pdf (Accessed 20 January 2021).

Dudovskiy, J. 2019. Reliability and validity. *Necessary knowledge to conduct business research*. *Available:* https://researchmethodology.net/research-methodology/reliability-validity-and- repeatability/researchvalidity. (Accessed 18 February 2020).

DUT. 2020. *Background*. Available: https://library.dut.ac.za/about-us/background/ (Accessed 26 February 2021).

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M. and Williams, M. D. 2019. Re-examining the unified theory of acceptance and use of technology (UTAUT): towards a revised theoretical model. *Information Systems Frontiers*, 21 (3): 719- 734.

Elahi, H., Islam, S. and Begum, D. 2018. Perception on the use of mobile phones in retrieving information from academic libraries: a developing country perspective. *International Journal of Knowledge Content Development and Technology*, 8 (1): 37-50.

Elliott, V. 2018. Thinking about the coding process in qualitative data analysis. *The Qualitative Report*, 23 (11): 2850-2861.

Enakrire, R. T. and Ocholla, D. N. 2017. Information and communication technologies for knowledge management in academic libraries in Nigeria and South Africa. *South African Journal of Information Management*, 19 (1): 1-9.

Evans, C. and Lewis, J. 2018. *Analysing semi-structured interviews using thematic analysis: Exploring voluntary civic participation among adults*. SAGE. Available: http://dx.doi.org/10.4135/9781526439284 (Accessed 15 July 2021).

Fink, A. 2020. *Conducting research literature reviews: from the internet to paper*. 5th ed. Los Angeles: SAGE.

Gill, M. J. 2020. How can I study who you are? Comparing grounded theory and phenomenology as methodological approaches to identity work research. In: *The Oxford Handbook of Identities in Organisations*. Oxford: Oxford University Press, 295 – 310.

Gray, L. M., Wong-Wylie, G., Rempel, G. R. and Cook, K. 2020. Expanding qualitative research interviewing strategies: Zoom video communications. *The Qualitative Report*, 25 (5): 1292-1301.

Gul, S. and Bano, S. 2019. Smart libraries: an emerging and innovative technological habitat of 21st century. *The Electronic Library*, 37 (5): 764-783.

Guo, Y., Yang, Z., Yang, Z., Liu, Y. Q., Bielefield, A. and Tharp, G. 2020. The provision of patron services in Chinese academic libraries responding to the COVID-19 pandemic. *Library Hi Tech* 39(2): 533-548. Available: https://www.emerald.com/insight/content/doi/10.1108/LHT-04-2020-0098/full/pdf (Accessed 15 May 2021).

Hai-Jew, S. 2020. Evaluating MS Teams for teaching and learning. *C2C Digital Magazine,* 1 (13). Available: https://scalar.usc.edu/works/c2c-digital-magazine-spring--summer-2020-/index (Accessed 25 July 2021).

Hamad, F., Farajat, S. and Hamarsha, A. 2018. Awareness and adoption of mobile technologies in the delivery of services in academic libraries in Jordan: A library staff perspective. *Global Knowledge, Memory and Communication*, 67 (6/7): 438-457.

Hamidi, H. and Chavoshi, A. 2018. Analysis of the essential factors for the adoption of mobile learning in higher education: A case study of students of the University of Technology. *Telematics and Informatics* 35(4): 1053-1070. Available: https://www.sciencedirect.com/science/article/abs/pii/S0736585317302277 (Accessed 17 June 2019).

Hanbidge, Alice Schmidt, Sanderson, Nicole, Tin and Tony. 2015. Using mobile technology to enhance undergraduate student digital information literacy skills: a Canadian case study. *spec ed p108*, 121

Harlow, S. and Hill, K. 2020. Assessing library online patrons use of resources to improve outreach and marketing. *The Serials Librarian*, 79 (1-2): 200-227.

Hart, C. 2018. *Doing a literature review: releasing the research imagination*. SAGE.

Hayashi Jr, P., Abib, G. and Hoppen, N. 2019. Validity in qualitative research: a processual approach. *The Qualitative Report*, 24 (1): 98-112.

Heath, J., Williamson, H., Williams, L. and Harcourt, D. 2018. “It's just more personal”: Using multiple methods of qualitative data collection to facilitate participation in research focusing on sensitive subjects. *Applied Nursing Research*, 43: 30-35.

Hilton, C. E. 2017. The importance of pretesting questionnaires: a field research example of cognitive pretesting the Exercise referral Quality of Life Scale (ER-QLS). *International Journal of Social Research Methodology*, 20 (1): 21-34.

Hisle, W. L. 2002. Top issues facing academic libraries: a report of the focus on the future task force. *College and Research Libraries News*, 63 (10).

Howard, M. C. 2018. Scale pretesting. *Practical assessment, research, and evaluation*, 23 (1): 5

Howlader, A. I. and Islam, M. A. 2019. Information-seeking behaviour of undergraduate students: a developing country perspective. *IFLA Journal*: 0340035219842312. Available: https://doi.org/10.1177/0340035219842312 (Accessed 19 June 2019).

Huffman, S., Shaw, E. and Loyless, S. 2019. Ensuring ethics and equity: policy, planning, and digital citizenship. *Education*, 140 (2): 87-99.

Hsu, H.-H. 2012. The acceptance of Moodle: an empirical study based on UTAUT. *Creative Education* 3: 44. Available: https://file.scirp.org/pdf/CE_2013011708271235.pdf (Accessed 18 May 2020).

Ifijeh, G. and Yusuf, F. 2020. Covid–19 pandemic and the future of Nigeria's university system: the quest for libraries' relevance. *The Journal of Academic Librarianship*, 46 (6): 1-7. Available: https://doi.org/10.1016/j.acalib.2020.102226 (Accessed 15 July 2021).

Ingole, M. D. 2020. A Study of changing role of library professional in digital environment. *Parishodh Journal,* 9 (3): 10532-10542. Available: http://www.parishodhpu.com/gallery/1280-p-march-2020.pdf (Accessed 5 May 2021).

Jacob, J. and Pattusamy, M. 2020. Examining the inter-relationships of UTAUT constructs in mobile Internet use in India and Germany. *Journal of Electronic Commerce in Organizations (JECO)*, 18 (2): 36-48.

Jamali, H. R. 2018. Does research using qualitative methods (grounded theory, ethnography, and phenomenology) have more impact? *Library and Information Science Research*, 40 (3-4): 201-207.

Johnson, A. M. 2019. Connections, conversations, and visibility: how the work of academic reference and liaison librarians is evolving. *Reference and User Services Quarterly*, 58 (2): 91-102.

Julien, H., Gross, M. and Latham, D. 2018. Survey of information literacy instructional practices in US academic libraries. *College and research libraries*, 79 (2): 179.

Kaiser, K. 2009. Protecting respondent confidentiality in qualitative research. *Qualitative health research*, 19 (11): 1632-1641.

Kaliisa, R. and Michelle, P. 2019. Mobile learning policy and practice in Africa: towards inclusive and equitable access to higher education. *Australasian Journal of*

Educational Technology, *35* (6): 1-14. Available: https://doi.org/10.14742/ajet.5562 (Accessed 25 June 2021)

Khechine, H., Raymond, B. and Augier, M. 2020. The adoption of a social learning system: intrinsic value in the UTAUT model. *British Journal of Educational Technology* 51(6): 2306-2325. Available: https://bera-journals.onlinelibrary.wiley.com/doi/pdf/10.1111/bjet.12905 (Accessed 25 June 2021).

Khlaif, Z. 2018. Teachers' perceptions of factors affecting their adoption and acceptance of mobile technology in K-12 settings. *Computers in the Schools*, 35 (1): 49-67.

Kiger, M. E. and Varpio, L. 2020. Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical teacher*, 42 (8): 846-854.

Kim, D. 2017. U.S. College students' use of mobile devices in the classroom and their perceptions on banning policy. Doctor of Education, Western Illinois University. Available: https://www.proquest.com/docview/2002539881/fulltextPDF/AC08466926E74290PQ/1?accountid=10612 (Accessed 22 April 2021).

Kim, H. J., Yi, P. and Hong, J. I. 2020. Students' academic use of mobile technology and higher-order thinking skills: The role of active engagement. *Education Sciences*, 10 (3): 47.

Kim, J. and Loewenstein, J. 2021. Analogical encoding fosters ethical decision making because improved knowledge of ethical principles increases moral awareness. *Journal of Business Ethics* 172(2): 307-324. Available: https://loewenstein.web.illinois.edu/papers/Kim&Loewenstein%20JBE20.pdf (Accessed 28 August 2021).

King, D. L. 2018. How to stay on top of emerging technology trends for libraries. *Library Technology Reports*, 54 (2): 1-35.

Kraft, N. L. 2018. Academic use of mobile technology by student athletes at a large division 1 Midwestern University: a grounded theory study. Doctor of Education in Educational Leadership, Lamar University. Available: https://kb.osu.edu/bitstream/handle/1811/85662/1/kraft-nicole-dissertation.pdf (Accessed 22 April 2021).

Kubat, G. 2017. The mobile future of university libraries and an analysis of the Turkish case. *Information and Learning Science* 118 (3/4): 120.

Kuckartz, U. 2019. Qualitative text analysis: a systematic approach. In: Kaiser, G. and Presmeg, N. eds. *Compendium for early career researchers in mathematics education*. Cham: Springer Nature, 181-198. Available: https://doi.org/10.1007/978-3-030-15636-7 (Accessed 15 June 2021)

Kumar, R. 2017. Implementation of mobile based services and technologies in libraries. *Worldwide Journal of Multidisciplinary Research and Development* 3 (6): 103-107. Available: http://wwjmrd.com/upload/implementation-of-mobile-based-services-and-technologies-in-libraries_1516181232.pdf (Accessed 15 July 2021).

Kvalsvik, F. and Øgaard, T. 2021. Dyadic interviews versus In-depth individual interviews in exploring food choices of Norwegian older adults: a comparison of two qualitative methods. *Foods*, 10 (6): 1199.

Lau, K. S., Lo, P., Chiu, D. K., Ho, K. K., Jiang, T., Zhou, Q., Percy, P. and Allard, B. 2020. Library and learning experiences turned mobile: a comparative study between LIS and non-LIS students. *The Journal of Academic Librarianship*, 46 (2): 102-103.

Lenzner, T., Neuert, C. and Otto, W. 2016. *Cognitive pretesting*. Mannheim: GESIS

Lester, J. N., Cho, Y. and Lochmiller, C. R. 2020. Learning to do qualitative data analysis: a starting point. *Human Resource Development Review*, 19 (1): 94-106. Available: https://journals.sagepub.com/doi/pdf/10.1177/1534484320903890 (Accessed 20 August 2021)

Lever, K. M. and Katz, J. E. 2006. Cell phones in campus libraries: an analysis of policy responses to an invasive mobile technology. *Information Processing and Management*, 43 (2007): 1133–1139.

Li, S., Jiao, F., Zhang, Y. and Xu, X. 2019. Problems and changes in digital libraries in the age of big data from the perspective of user services. *The Journal of Academic Librarianship,* 45 (1): 22-30. Available: https://www.sciencedirect.com/science/article/pii/S0099133318302532 (Accessed 25 July 2021).

Li, X. and Li, T. 2021. The evolving responsibilities, roles, and competencies of East Asian studies librarians: a content analysis of job postings from 2008 to 2019. *College and Research Libraries,* 82(4): 474. Available: https://crl.acrl.org/index.php/crl/article/view/24983/32849 (Accessed 19 August 2021).

Lippincott, J. K. 2010. A mobile future for academic libraries. *Reference services review*, 38 (2): 205-213.

Little, G. 2011. Keeping moving: smart phone and mobile technologies in the academic library. *The Journal of Academic Librarianship*, 37 (3): 267-269.

Liu, Y. Q. and Briggs, S. 2015. A library in the palm of your hand: mobile services in top 100 university libraries. *Information Technology And Libraries*, 34 (2): 133-148.

Lombard, E. 2018. Gender and leadership in academic libraries. *The Journal of Academic Librarianship* 44 (2): 226-230. Available:

https://www.sciencedirect.com/science/article/pii/S0099133317304573 (Accessed 15 September 2021).

Lucas, D. 2020. Emotional intelligence for librarians. *Library Leadership and Management*, 34 (3):1-14. Available: https://doi.org/10.5860/llm.v34i3.7452 (Accessed 18 June 2021).

Mabweazara, R. M. 2018. The 21st century academic library: the case of three state universities in Zimbabwe. Doctor of Philosophy, University of the Western Cape. Available: https://etd.uwc.ac.za/bitstream/handle/11394/6466/MABWEAZARA_MLIS_2018.pdf?sequence=1&isAllowed=n (Accessed 20 July 2021).

Machi, L. A. and McEvoy, B. T. 2016. *The literature review: six steps to success*. 3rd ed. California: Corwin Press.

Maguire, M. and Delahunt, B. 2017. Doing a thematic analysis: a practical, step-by-step guide for learning and teaching scholars. *All Ireland Journal of Higher Education*, 8 (3): 3351-33514. Available: https://ojs.aishe.org/index.php/aishe-j/article/view/335/553 (Accessed 15 May 2021).

Mahat-Shamir, M., Neimeyer, R. A. and Pitcho-Prelorentzos, S. 2021. Designing in-depth semi-structured interviews for revealing meaning reconstruction after loss. *Death studies*, 45 (2): 83-90. Available: https://doi.org/10.1080/07481187.2019.1617388 (Accessed 15 May 2021).

Maideen, S. 2017. Mobile technologies for academic libraries: an overview. Paper presented at the *Emerging Trends in Library and Information Science*. Available: https://www.researchgate.net/publication/315516134_Mobile_Technologies_for_Academic_Libraries_An_Overview (Accessed 20 July 2021).

Makombe, G. 2017. An expose of the relationship between paradigm, method and design in research. *The Qualitative Report,* 22 (12): 3363-3382. Available: https://doi.org/10.46743/2160-3715/2017.3054 (Accessed 15 March 2021).

Mann, L. 2019. Information literacy and instruction: making a place for makerspaces in information literacy. *Reference and User Services Quarterly*, 58 (2): 82-86.

Mansouri, A. and Asl, N. S. 2019. Assessing mobile application components in providing library services. *The Electronic Library*. Available: https://www.researchgate.net/deref/https%3A%2F%2Fdoi.org%2F10.1108%2FEL-10-2018-0204 (Accessed 15 May 2021).

Margam, M. and Dar, S. A. 2017. Mobile information services and initiatives in university libraries: a new way of delivering information. *DESIDOC Journal of Library and Information Technology*, 37 (2): 109.

Masinde, M. and Roux, P. A. 2020. Transforming South Africa's universities of technology: a roadmap through 4IR lenses.
Journal of Construction Project Management and Innovation, 10 (2): 30-50.

Matthews, J. R. 2017. *The evaluation and measurement of library services*. 2nd ed. Santa Barbara, California: Libraries Unlimited .Available: https://books.google.co.za/books?id=1oE5DwAAQBAJ&lpg=PP1&ots=JBAAfATUuX&dq=Matthews%2C%20J.%20R.%202017.%20The%20evaluation%20and%20measurement%20of%20library%20services.%20online%3A%20ABC-Clio.&lr&pg=PP1#v=onepage&q=Matthews,%20J.%20R.%202017.%20The%20evaluation%20and%20measurement%20of%20library%20services.%20online:%20ABC-Clio.&f=false (Accessed 20 August 2021).

Mawere, T. and Sai, K. O. 2018. An investigation on e-resource utilisation among university students in a developing country: a case of great Zimbabwe University. *South African Journal of Information Management*, 20 (1): 1-7. Available: https://journals.co.za/doi/pdf/10.4102/sajim.v20i1.860 (Accessed 18 June 2021).

Mbambo-Thata, B. 2010. Assessing the impact of new technology on internal operations: with special reference to the introduction of mobile phone services at UNISA Library. *Library Management,* 31 (6): 466-475. Available: https://www.emerald.com/insight/content/doi/10.1108/01435121011066216/full/html (Accessed 21 October 2020).

Mbambo-Thata, B., Du, J. T., Lang, U., Lau, J., Mostafa, A. W., Mehra, B., Chu, C. M. and Raju, J. 2019. Gender inclusivity and equity in academic libraries: Insights from around the globe. *International Insights,* 80 (8): 438-442. Available: https://crln.acrl.org/index.php/crlnews/article/view/23546/30867 (Accessed 15 September 2020).

McCombes, S. 2021. *How to write a thesis conclusion*. Available: https://www.scribbr.com/dissertation/write-conclusion/ (Accessed 6 August 2021).

McGrath, C., Palmgren, P. J. and Liljedahl, M. 2019. Twelve tips for conducting qualitative research interviews. *Medical Teacher*, 41 (9): 1002-1006.

Miller, S. 2019. Whither the university? Universities of technology and the problem of institutional purpose. *Science and engineering ethics*, 25 (6): 1679-1698.

Mirembe, D. P., Lubega, J. T. and Kibukamusoke, M. 2019. Leveraging social media in higher education: a case of universities in Uganda. *European Journal of Open, Distance and E-Learning*, 22(1): 70-84. Available: https://files.eric.ed.gov/fulltext/EJ1235081.pdf (Accessed 18 April 2020).

Moorthy, K., Chun T'ing, L., Ming, K. S., Ping, C. C., Ping, L. Y., Joe, L. Q. and Jie, W. Y. 2019. Behavioural intention to adopt digital library by the undergraduates. *International Information and Library Review*, 51 (2): 128-144. Available: : https://doi.org/10.1080/10572317.2018.1463049 (Accessed 15 June 2021)

Morales, D. T. and Trinidad, F. L. 2019. Digital mortgage banking acceptability in Philippine universal banks: evidence from UTAUT model. *Journal of Information*, 4 (15): 1-15.

Morgan, R. J., Gipson, T. A. and Robinson, L. E. 2019. Librarians building innovative mobile technologies: creating it ourselves. *Journal of Electronic Resources Librarianship*, 31 (2): 79-87. Available: https://doi.org/10.1080/1941126X.2019.1597441 (Accessed 18 May 2021).

Mpofu, B. 2016. University students use of computers and mobile devices for learning and their reading speed on different platforms. *Universal Journal of Educational Research*, 4 (4): 926-932.

Mthembu, Q. N. 2018a. Employment practices of student library assistants in academic libraries in KwaZulu-Natal. Master of Management Sciences in Library and Information Science, Durban University of Technology. Available: https://doi.org/https://doi.org/10.51415/10321/3378 (Accessed 20 July 2021).

Mugwisi, T. 2015. Role of librarians in teaching information literacy in Zimbabwean and South African universities: a comparative study. *Mousaion*, 33 (1): 23-42.

Mukred, M., Yusof, Z. M., Alotaibi, F. M., Mokhtar, U. A. and Fauzi, F. 2019. The Key Factors in Adopting an Electronic Records Management System (ERMS) in the Educational Sector: A UTAUT-Based Framework. *IEEE Access*, 7: 35963-35980.

MUT. 2020. *Our Mission and History*. Available: https://www.mut.ac.za/our-mission-history/ (Accessed 16 February 2021).

Nakitare, J., Sawe, E., Nyambala, J. and Kwanya, T. 2020. The emerging roles of academic librarians in Kenya: apomediaries or infomediaries?. *Library Management*, 41 (6/7): 339-353. Available: https://doi.org/10.1108/LM-04-2020-0076 (Accessed 20 June 2021).

Neerputh, S. 2014. Academic integration of libraries at Universities of Technology (UoTs) in South Africa. Doctor of Technology, Library and Information Studies, Durban University of Technology. Available: http://openscholar.dut.ac.za/bitstream/10321/1154/1/NEERPUTH_2014.pdf (Accessed 27 January 2019).

Ngesi, N., Landa, N., Madikiza, N., Cekiso, M. P., Tshotsho, B. and Walters, L. M. 2018. Use of mobile phones as supplementary teaching and learning tools to learners in South Africa. *Reading and Writing*, 9 (1): 1-12. Available: https://hdl.handle.net/10520/EJC-134833414a (Accessed 14 July 2021).

Nitecki, D. A. and Davis, M. E. K. 2017. *Changing landscapes: new roles for academic librarians*. Available: http://library.ifla.org/id/eprint/1798/1/S06-2017-nitecki-en.pdf (Accessed 5 September 2021).

NLSA. 2018. National policy for library and information services in South Africa. National Library of South Africa. Pretoria. Available: https://www.nlsa.ac.za/condgrant/images/PDF/Draft-4-Final-14-March-2.pdf (Accessed 5 September 2021).

Nysveen, H., Nysveen, H., Pedersen, P. E. and Pedersen, P. E. 2016. Consumer adoption of RFID-enabled services: applying an extended UTAUT model. *Information Systems Frontiers*, 18 (2): 293-314.

Ocholla, D. 2002. Diversity in the library and information workplace: a South African perspective. *Library Management*, 23 (1/2):59-67. Available: https://www.researchgate.net/publication/259576317_Diversity_in_the_library_and_information_workplacea_South_African_perspective (Accessed 15 January 2022)

Ocran, T. 2017. Perception of students on mobile technology-based library services. *Library Philosophy and Practice,* 1802. Available: https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=5065&context=libphilprac (Accessed 5 September 2021).

Ocran, T. K., Underwood, P. G. and Arthur, P. A. 2020. Strategies for successful implementation of mobile phone library services. *The Journal of Academic Librarianship,* 46 (5): 102174. Available: https://www.sciencedirect.com/science/article/pii/S009913332030077X (Accessed 15 August 2021).

Okai-Ugbaje, S., Ardzejewska, K. and Imran, A. 2020. Readiness, roles, and responsibilities of stakeholders for sustainable mobile learning adoption in higher education. *Education Sciences*, 10 (3): 49.

Okeji, C. C., Tralagba, E. C. and Obi, I. C. 2019. An investigation of the digital literacy skills and knowledge-based competencies among librarians working in university libraries in Nigeria. *Global Knowledge, Memory and Communication,* 69 (4/5): 311-330. Available: https://www.emerald.com/insight/content/doi/10.1108/GKMC-05-2019-0054/full/html (Accessed 18 September 2020).

Okike, B. I. 2020. Information dissemination in an era of a pandemic (COVID-19): librarians' role. *Library Hi Tech News,* 37 (9): 1-4. Available: https://www.emerald.com/insight/content/doi/10.1108/LHTN-04-2020-0040/full/html (Accessed 15 August 2021).

Owusu-Acheaw, M. and Larson, A.G., 2015. Use of social media and its impact on academic performance of tertiary institution students: A study of students of Koforidua Polytechnic, Ghana. *Journal of Education and Practice*, *6* (6):94-102. Available: https://files.eric.ed.gov/fulltext/EJ1083595.pdf (Accessed 15 June 2021).

Oye, N., Iahad, N. and Rahim, N. A. 2014. The history of UTAUT model and its impact on ICT acceptance and usage by academicians. *Education and Information Technologies*, 19 (1): 251-270.

Palau-Saumell, R., Forgas-Coll, S., Sánchez-García, J. and Robres, E. 2019. User acceptance of mobile apps for restaurants: an expanded and extended UTAUT-2. *Sustainability,* 11 (4): 1210. Available: https://www.mdpi.com/2071-1050/11/4/1210 (Accessed 7 February 2020).

Palmatier, R. W., Houston, M. B. and Hulland, J. 2018. Review articles: purpose, process, and structure. *Journal of the Academy of Marketing Science*, 46: 1-5. Available: https://link.springer.com/article/10.1007/s11747-017-0563-4 (Accessed 28 July 2021).

Panahi, S., Roostaei, N. and Nemati-Anaraki, L. 2021. Using social media for marketing library services in libraries of Iran, Tehran, and Shahid Beheshti medical universities. *Journal of Medical Library and Information Science*, 2: 1-8. Available: http://doi.org/10.22037/jmlis.v2i.32509 (Accessed 18 December 2021).

Peters, M. A. 2017. Technological unemployment: educating for the fourth industrial revolution. *Educational Philosophy and Theory*, 49 (1): 1-6.

Peterson, C. H., Peterson, N. A. and Powell, K. G. 2017. Cognitive interviewing for item development: Validity evidence based on content and response processes. *Measurement and Evaluation in Counselling and Development*, 50 (4): 217-223.

Poláková, P. and Klímová, B. 2019. Mobile technology and Generation Z in the English language classroom: a preliminary study. *Education Sciences*, 9 (3): 203.

Pospelova, A., Tsurtsumia, R. and Tsibulnikova, M. 2018. Embedded librarians as providers of knowledge services. *portal: Libraries and the Academy,* 18 (4): 651-669. Available: http://dx.doi.org/10.1353/pla.2018.0039 (Accessed 12 March 2021).

Queirós, A., Faria, D. and Almeida, F. 2017. Strengths and limitations of qualitative and quantitative research methods. *European Journal of Education Studies*, 3 (9): 369-387. Available: https://zenodo.org/record/887089#.YePT1_5ByUk (Accessed 25 June 2021).

Qutoshi, S. B. 2018. Phenomenology: a philosophy and method of inquiry. *Journal of Education and Educational Development*, 5 (1): 215-222.

Rafiq, M., Batool, S. H., Ali, A. F. and Ullah, M. 2021. University libraries response to COVID-19 pandemic: a developing country perspective. *The Journal of Academic Librarianship*, 47 (1): 102280.

Rafique, H., Almagrabi, A. O., Shamim, A., Anwar, F. and Bashir, A. K. 2020. Investigating the acceptance of mobile library applications with an extended technology acceptance model (TAM). *Computers and Education*, 145: 103732. Available: https://doi.org/10.1016/j.compedu.2019.103732 (Accessed 15 June 2021).

Raju, J. 2008. LIS qualifications in an African context: considerations from a South African study. *South African Journal of Libraries and Information Science*, 74 (2): 129-137. Available: https://journals.co.za/doi/pdf/10.10520/EJC61299 (Accessed 21 September 2020).

Raju, J. 2017. To teach or not to teach? the question of the academic librarian's pedagogical competencies in the digital age. *South African Journal of Higher Education,* 31 (2): 251-269. Available: https://doi.org/10.208535/31-2-1096 (Accessed 15 March 2021).

Rallis, S. and Rossman, G. 2017. *An introduction to qualitative research*. Thousand Oaks, CA: SAGE.

Rambe, P. 2016. The Role of educational technology in design and delivery of curricula programs: a case of steps at a university of technology. *The African journal of information systems,* 18 (2): 86-113.

Rempel, H. G. and Mellinger, M. 2015. Bibliographic management tool adoption and use: a qualitative research study using the UTAUT model. *Reference and User Services Quarterly*, 54 (4): 43-53.

Rice-Lively, M. L. and Racine, D. J. 1997. The role of academic librarians in the era of information technology. *Journal of Academic Librarianship,* 23 (1): 31-41

Roberts, N. and Rees, M. 2014. Student use of mobile devices in university lectures. *Australasian Journal of Educational Technology*, 30 (4): 415-426.

Roller, M. R. 2019. A quality approach to qualitative content analysis: similarities and differences compared to other qualitative methods. In: *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *20* (3): 31. Available: http://dx.doi.org/10.17169/fqs-20.3.3385 (Accessed 25 April 2021).

Roth, W. M. and Unger, H. v. 2018. Current perspectives on research ethics in qualitative research. *Research Ethics in Qualitative Research,* 19 (3), 1-12. Available: https://doi.org/10.17169/fqs-19.3.3155 (Accessed 27 April 2021).

Ruxwana, N. and Msibi, M. 2018. A South African university's readiness assessment for bringing your own device for teaching and learning. *South African Journal of Information Management*, 20 (1): 1-6. Available: https://journals.co.za/doi/pdf/10.4102/sajim.v20i1.926 (Accessed 27 April 2021).

Saavedra, E.K. 2018. The effects of mobile devices on student learning in a New Zealand-based university preparation course: a case study. Doctor of Education, University of Southern Queensland. Available: https://eprints.usq.edu.au/34914/1/Saavedra_2018_whole.pdf (Accessed 27 June 2021).

Saragossi, J., Costello, L. and Kasten, K. 2018. Mobile applications in academic libraries. (Report). 4 (198). Available: https://doi.org/10.5860/lrts.62n4.198 (Accessed 27 April 2020).

Saravani, S.-J. and Haddow, G. 2017. A theory of mobile library service delivery. *Journal of Librarianship and Information Science*, 49 (2): 131-143.

Saunders, L. 2015. Academic libraries' strategic plans: top trends and under-recognized areas. *The Journal of Academic Librarianship*, 41 (3): 285-291.

Sekaran, U. and Bougie, R. J. 2016. *Research methods for business*. New York: Wiley.

Semenza, J. L., Koury, R. and Shropshire, S. 2017. Diversity at work in academic libraries 2010-2015: an annotated bibliography. *Collection Building*, 36 (3): 89-95. Available: https://doi.org/10.1108/CB-12-2016-0038 (Accessed 20 June 2021).

Sharma, R. and Madhusudhan, M. 2017. Use of mobile devices by library and information science students in Central Universities of Uttar Pradesh. *DESIDOC Journal of Library and Information Technology,* 37 (4). Available: https://doi.org/10.14429/djlit.37.4.11505 (Accessed 12 July 2020).

Shava, H. and Chinyamurindi, W. T. 2018. Determinants of social media usage among a sample of rural South African youth. *South African Journal of Information Management*, 20 (1): 1-8.

Shetty, S. 2021. *Determining sample size for qualitative research: what is the magical number?* . Available: https://interq-research.com/determining-sample-size-for-qualitative-research-what-is-the-magical-number/ (Accessed 9 April 2021).

Shirley, J., Mawire, B. and Baloyi-Sekese, M. 2020. COVID-19 and the National Library of South Africa: adapting to the new normal. *Alexandria*, 30 (2-3): 201-208.

Shonhe, L. and Jain, P. 2017. Information dissemination in the 21st century: the use of mobile technologies. In: Mnjama, N. and Jain, P. (Ed.). *Information and Knowledge for Competitiveness*. Department of Library and Information Studies-University of Botswana. Gaborone: 425- 447.

Sim, J. and Waterfield, J. 2019. Focus group methodology: some ethical challenges. *Quality and Quantity*, 53 (6): 3003-3022.

Singh, K. and Nikandia, P. K. 2017. Role of mobile technology and their application in library services in digital era. *International Research: Journal of Library and Information Science*, 7 (1): 157-166. Available: 11-IR-392.pdf (irjlis.com) (Accessed 15 June 2021).

Sivakumar, P.S. 2020. Content analysis, thematic analysis and hands-on session with NVIVO. In: Aggarwal, R. (Ed.) *Advances in Research Methodology for Social Sciences*, *CAAST 2020*. Icar Iari, New Delhi 31 August – 4 September 2020. New Delhi: CAAST, 57-62. Available: https://nahep-test.iari.res.in/wp-content/uploads/2021/07/Compendium-Aug-31-Sep-4-2020.pdf#page=57 (Accessed 26 July 2021)

Smith, J. A. and Shinebourne, P. 2012. *Interpretative phenomenological analysis*. Thousand Oaks : American Psychological Association.

Sousa, D. 2014. Validation in qualitative research: general aspects and specificities of the descriptive phenomenological method. *Qualitative Research in Psychology*, 11 (2): 211-227.

South Africa. 2021. *What is Coronavirus / COVID-19*. Government of South Africa. Available: https://www.gov.za/covid-19/about/what-is-covid19#what (Accessed 12 March 2021).

Sutton, J. and Austin, Z. 2015. Qualitative research: data collection, analysis, and management. *The Canadian Journal of Hospital Pharmacy*, 68 (3): 226.

Taebi, B., van den Hoven, J. and Bird, S. J. 2019. The importance of ethics in modern universities of technology. *Science and Engineering Ethics*, 25 (6): 1625-1632.

Tait, E., Martzoukou, K. and Reid, P. 2016. Libraries for the future: the role of IT utilities in the transformation of academic libraries. *Palgrave Communications,* 2(1): 1-9. Available: https://www.nature.com/articles/palcomms201670 (Accessed 12 July 2020).

Tak, P. and Panwar, S. 2017. Using UTAUT 2 model to predict mobile app-based shopping: evidence from India. *Journal of Indian Business Research*, 9 (3): 248- 264.

Taylor, D. M. 2016. Academic librarians' practices and perceptions on web-based instruction for academic library patrons as adult learners. Doctor of Education, University of Memphis. Available: https://eric.ed.gov/?id=ED576098 (Accessed 13 February 2020).

Theofanidis, D. and Fountouki, A. 2019. Limitations and delimitations in the research process. *Perioperative Nursing,* 7 (3): 155-162. Available: https://www.spnj.gr/articlefiles/volume7_issue3/pn_sep_73_155_162b.pdf (Accessed 21 July 2021).

Tzanova, S., Bossu, C. and Heck, T. 2020. Changes in academic libraries in the era of open science. *Education for Information*, 36 (3): 281-281-299.

Ubogu, J. O. 2021. The role of librarian in the twenty-first century. In: Chigwada, J. P. and Nwaohiri, N. M. (Eds.). *Examining the Impact of Industry 4.0 on Academic Libraries*. Emerald Publishing Limited, 91-102. Available: https://doi.org/10.1108/978-1-80043-656-520201017 (Accessed 4 August 2021).

Upadhyay, N. 2015. Trends that will affect technology and resource decision in academic libraries in near future. In: Proceedings of *2015 4th International Symposium on Emerging Trends and Technologies in Libraries and Information Services*. IEEE, 75-79. Available: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7048175 (Accessed 12 July 2020).

Van der Walt, S. and Du Plessis, T. 2010. Age diversity and the aging librarian in academic libraries in South Africa. *South African Journal of Libraries and Information Science*, 76 (1): 1-10.

Van Scoy, A. 2019. Bridging the chasm: Faculty support roles for academic librarians in the adoption of open educational resources. *College and Research Libraries*, 80 (4): 426.

Vasileiou, K., Barnett, J., Thorpe, S. and Young, T. 2018. Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC Medical Research methodology*, 18 (1): 1-18.

Vongjaturapat, S. 2018. Application of the task-technology fit model to structure and evaluation of the adoption of smartphones for online library systems. *Science and Technology Asia*: 39-56.

Wai, I. S. H., Ng, S. S. Y., Chiu, D. K., Ho, K. K. and Lo, P. 2018. Exploring undergraduate students' usage pattern of mobile apps for education. *Journal of Librarianship and Information Science*, 50 (1): 34-47. Available: https://doi.org/10.1177%2F0961000616662699 (Accessed 15 June 2021).

Wang, P., Chiu, D. K. W., Ho, K. K. W. and Lo, P. 2016. Why read it on your mobile device? Change in reading habit of electronic magazines for university students. *The Journal of Academic Librarianship*, 42 (6): 664-669. Available: https://doi.org/10.1016/j.acalib.2016.08.007 (Accessed 18 June 2021).

Waral, N. L. 2020. Innovative marketing strategies in academic libraries: an overview. *Innovations in the Designing and Marketing of Information Services*, 1-15. Available: viewtitlesample.aspx (igi-global.com) (Accessed 21 July 2021)

Wei, M.-F., Luh, Y.-H., Huang, Y.-H. and Chang, Y.-C. 2021. Young generation's mobile payment adoption behaviour: Analysis based on an extended UTAUT model. *Journal of Theoretical and Applied Electronic Commerce Research*, 16 (4): 618-637.

Wesselink, J. 2019. *Simplifying and pre-testing the Dweck mindset instrument and self-efficacy formative questionnaire among VMBO students: using the three-step test-interview (TSTI)*: University of Twente. Available: http://essay.utwente.nl/78186/1/Wesselink_BA_psychology.pdf (Accessed 12 August 2021).

WHO. 2021. *Coronavirus disease (COVID-19): How is it transmitted?* Available: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19-how-is-it-transmitted (Accessed 15 July 2021).

Williams, M. D., Rana, N. P. and Dwivedi, Y. K. 2015. The unified theory of acceptance and use of technology (UTAUT): a literature review. *Journal of enterprise information management,* 28 (3): 443-488. Available: https://www.emerald.com/insight/content/doi/10.1108/JEIM-09-2014-0088/full/html (Accessed 12 July 2020).

Williams, M. L., Saunderson, I. P. and Dhoest, A. 2021a. Students' perceptions of the adoption and use of social media in academic libraries: a UTAUT study. *South African Journal for Communication Theory and Research,* 47 (1): 76-94. Available: https://www.tandfonline.com/doi/pdf/10.1080/02500167.2021.1876123 (Accessed 28 August 2021).

Winqvist, J. 2021. *5 Reasons why you should start using Microsoft Teams today*. Available: https://pulse.microsoft.com/en/work-productivity-en/na/fa2-reasons-why-you-should-start-using-microsoft-teams-today/ (Accessed 02 March 2021).

Wong, C. H. H. 2015. A study of mobile learning for Guangzhou's University students. Doctor of Education, The Hongkon Institute of Education. Available:

http://libdr1.eduhk.hk/pubdata/img00/arch00/link/archive/1/instarh/4352_image.pdf (Accessed 21 Jan 2021).

Woodrow, L. 2014. Reliability, validity and ethics. In: *Writing about quantitative research in applied linguistics*. London: Palgrave Macmillan, 25-35. Available: https://doi.org/10.1057/9780230369955_3 (Accessed 15 July 2021).

Xu, F. and Du, J. T. 2018. Factors influencing users' satisfaction and loyalty to digital libraries in Chinese universities. *Computers in Human Behaviour*, 83: 64-72.

Xu, F. and Du, J. T. 2019. Examining differences and similarities between graduate and undergraduate students' user satisfaction with digital libraries. *The Journal of Academic Librarianship*, 45 (6): 102072.

Xu, J., Kang, Q., Song, Z. and Clarke, C. P. 2015. Applications of mobile social media: WeChat among academic libraries in China. *The Journal of Academic Librarianship*, 41 (1): 21-30.

Yang, S. Q. and Li, L. 2015. *Emerging technologies for librarians: a practical approach to innovation*. San Diego, CA: Elsevier Science.

Yip, K. H. T., Lo, P., Ho, K. K. and Chiu, D. K. 2020. Adoption of mobile library apps as learning tools in higher education: a tale between Hong Kong and Japan. *Online Information Review,* 45 (2). Available: https://www.emerald.com/insight/content/doi/10.1108/OIR-07-2020-0287/full/html (Accessed 12 July 2021).

Yoon, H.-Y. 2016. User acceptance of mobile library applications in academic libraries: an application of the technology acceptance model. *The Journal of Academic Librarianship,* 42 (6): 687-693. Available: https://www.sciencedirect.com/science/article/abs/pii/S0099133316301707 (Accessed 12 March 2020).

Zhang, X., Lo, P., So, S., Chiu, D. K., Leung, T. N., Ho, K. K. and Stark, A. 2021. Medical students' attitudes and perceptions towards the effectiveness of mobile learning: a comparative information-need perspective. *Journal of Librarianship and Information Science*, 53 (1): 116-129.

ANNEXURE A

Faculty Research Office

Durban University of Technology Date Sept 4, 2020

Student Muvhulawa Romeo Matumba Student Number: 20152912

Degree: Master's of Management Sciences in Library and Information Science Email: MuvhulawaM@dut.ac.za

Dear Mr Matumba

ETHICAL APPROVAL: LEVEL 2

Your email correspondence in respect of the above refers.

Your proposal, titled "Perceptions of the University librarians on the use of mobile technology to provide library services in the UoTs in KwaZulu Natal " has been reviewed by two ethical reviewers and full ethical approval has been granted.

When ethics approval is granted:

You are required to present the letter at your research site(s) for permission to gather data. Please also note that your research instruments must be accompanied by the letter of information and the letter of consent for each participant, as per your research proposal.

This ethics clearance is valid from the date of provisional approval on this letter for one year A student must apply for recertification 3 months before the date of this expiry.

Recertification is required every year until after corrections are made, after examination, and the thesis is submitted to the Faculty Registrar.

A summary of your key research findings must be submitted to the FRC on completion of your studies.

Kindest regards. Yours sincerely

Prof Richard C Millham

Dept of IT, Faculty of Accounting and Informatics Ritson Campus

Durban University of Technology Durban, South Africa, 4001 Richardm1@dut.ac.za

+(27) 031 373 5542

ANNEXURE B

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

15th September 2020

Mr Muvhulawa R. Matumba

c/o Department of Information and Corporate management Faculty of Accounting and Informatics

Durban University of Technology Dear Mr Matumba

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 “Perceptions of academic librarians on the use mobile technology to provide services in the UoTs in KwaZulu Natal” 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 would be submitted to the IRIC on completion of your studies.

Kindest regards.

Yours sincerely

DR LINDA ZIKHONA LINGANISO

DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT DIRECTORATE

ANNEXURE C

PERMISSION LETTER

Department of Information & Corporate Management Library and Information Sciences

Durban University of Technology

16 September 2020

Mr Muvhulawa Romeo Matumba

PERMISSION TO CONDUCT RESEARCH AT THE DUT LIBRARY

Dear Mr Matumba

This letter serves as authorization for you to conduct the research project entitled, "*Perceptions of the University librarians on the use of mobile technology to provide library services in the UoTs in KwaZulu Natal*", at the DUT Library.

Upon review of the associated documentation 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 semi-structured interviews via MS Teams 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,

Lucille Webster (Library Director)

ANNEXURE D

MUT
MANGOSUTHU
UNIVERSITY OF TECHNOLOGY

Research Directorate

UMLAZI KWAZULU-NATAL
PO Box 12363 Jacobs 4026 Durban
Tel: 031 907 7450

08 February 2021

REF: RDO/02/2021

Mr Muvhulawa Romeo Matumba
Durban University of Technology

Dear Mr Matumba

PROTOCOL: Perceptions of the academic librarians on the use of mobile technology to provide library services in the UoTs in KwaZulu Natal

The MUT Research Ethics Committee considered your application at their meeting held on 18 January 2021. It is my pleasure to inform you that permission to conduct the research project above was granted.

The approval is valid for two years from 01 February 2021. Any changes to the project must immediately be brought to the attention of the MUT Research Ethics Committee.

Your acceptance of this approval denotes your compliance with South African National Research Ethics guidelines (2004) and the MUT Research Ethics Policy, Procedures and Guidelines

Good luck with your research.

Yours sincerely,

Dr A Mienie
Director: Research

ANNEXURE E

From: Nyide Bongiwe

To: Zungu, Mantombi; Ncwane, Siyab; Mpungose Noxolo Sweetness NS.; Masande Mafanga

Cc: Noni Bridget NB. Makhathini; Muvhulawa Romeo Matumba

Subject: Request to conduct interviews

Date: Friday, March 19, 2021 9:29:58 AM

Attachments: image003.png

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Colleagues

Mr Romeo Matumba is doing Research on “Perceptions of the academic librarians on the use of mobile technology to provide library services in the UoTs in KwaZulu Natal”, and has requested to conduct interviews with the User Services Librarians, particularly Subject Librarians and Evening/Reference Librarian.

I have copied Romeo on the email. He’ll be in contact with you to make arrangements. Kindly note that you are not compelled to participate, however, you will be assisting him towards completing his studies, and contributing to the body of knowledge.

@Romeo, kindly accept my apologies for the delayed relaying of your request.

Best Regards

MUT
MANGOSUTHU
UNIVERSITY OF TECHNOLOGY

Bongiwe Nyide

Deputy Director: Library Services

Tel: 031 907 7123 | Email: bnyide@mut.ac.za

P O Box 12363 Jacobs 4026

www.mut.ac.za

Disclaimer

The information contained in this communication from the sender is confidential. It is intended solely for use by the recipient and others authorized to receive it. If you are not the recipient, you are hereby notified that any disclosure, copying, distribution or taking action in relation of the contents of this information is strictly prohibited and may be unlawful.

This email has been scanned for viruses and malware, and may have been automatically archived by **Mimecast Ltd**, an innovator in Software as a Service (SaaS) for business. Providing a **safer** and **more useful** place for your human generated data. Specializing in; Security, archiving and compliance. To find out more Click Here.

ANNEXURE F

Interview schedule for semi-structured interviews with the academic librarians

The purpose of the study is to investigate the perceptions of the academic librarians on the use of **mobile technology** to provide **library services** at the Universities of Technology (UoTs) in KwaZulu Natal. In this study, the terms 'Mobile Technology' and 'Library Services' are used concurrently. These terms are defined below for your consideration:

Mobile technology refers to the mobile devices such as cell phones, smart phones, laptops, notebook, net book computers, audio mp3, cameras, iPad, and other devices that can be used to access the internet, messaging, email and other technological activities.

Library services refers to the services such as library catalogue/OPAC, access to e- books, e-journals, e-newspapers, book loans and renewals, information service consultations or subject librarians' consultations, past exam papers access, mobile printing and scanning, study group rooms, research guides, awareness services, SMS communication, access to information literacy training, guides, videos, presentations and tutorials.

Semi-structured Interview questions SECTION A

Gender
Race
Age
What is your current position/role in the organisation?
What are your primary task and responsibilities?
How long have you been in this position?
What is your highest qualification?

SECTION B
Social Influences (SI)
Social influences contributing to the behavioural intentions to adopt mobile technology. Do the library management encourage library staff to use mobile devices to access library services? If so, please explain how? Do users enquire about accessing library resources and services such as eBooks, e-journals, e- newspapers, library catalogue and library guides using mobile devices? if so, which users are more enquiring to such technology between staff or students? What do you think are the main influences of people wanting to move to mobile technology when it comes to library services?
Are there any services accessible on mobile devices that your library is now providing? If yes, which services are those, and for how long has the library been offering services accessible via mobile devices to users? Which services or resources do you normally encourage users to access via mobile devices? Is there a library policy that is used to guide or promote the use of mobile technology to access library services at your library?
Performance Expectancy (PE)
The usefulness of mobile technology in delivering library services. In your view, is mobile technology making your life easier in providing library services? If yes, please share how mobile technology is making your life easier and if no, please share how you wish mobile technology could make your life easier. From your experience in dealing with users, do users currently enjoy/can enjoy accessing some of these services via mobile devices and why? Based on your experience in using mobile technology, do you feel that all the academic libraries should adopt mobile technology as a delivery model for library services and why? Has providing services accessible via mobile devices affected/improved the way you execute your daily duties? If so, explain?

Are there services or duties that you no longer have to execute due to the availability of services accessible via mobile technologies at your library? If yes, explain how.
Efforts Expectancy (EE)
Efforts required to successfully adopting and using mobile technology as a delivery model for library services? Do you find it easy to use, market and communicate services accessible via mobile technology? Do you feel that you have enough knowledge regarding the use mobile technology to delivery library services? If yes, please elaborate on the knowledge you have and if no, please elaborate on the knowledge you feel you need to learn more about Have you received any support or training aimed at helping you to better understand/use mobile technology? If yes, what type of support have you received, if no, what type of support or training would you like to receive? In your view, do you feel the library is doing enough to make their library services accessible via mobile devices? In your opinion, is your library ready to fully adopt mobile technology as a delivery model for library services? Has your library done any survey to find out if users (especially students) have devices capable of accessing library services?
Facilitating Condition (FC)
Facilitating conditions contributing to the adoption of mobile technology What are the main factors that may be pushing the library toward mobile technology (e.g. Institutional pressure, Covid-19, new trends etc.)? Based on your experience, what are some of the barriers within your library or institution that might hinder the adoption of mobile technology for users? If there are barriers, what can you recommend as solution that may overcome these challenges? What type of support is given by your Library/institution that encourages the adoption of mobile technology?

ANNEXURE G

CONSENT

Statement of Agreement to Participate in the Research Study:

I hereby confirm that I have been informed by the researcher, (name of researcher), about the nature, conduct, benefits and risks of this study-Research Ethics Clearance Number: ___

I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.

I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.

In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.

I may, at any stage, without prejudice, withdraw my consent and participation in the study.

I have had sufficient opportunity to ask questions and (of my own freewill) declare myself prepared to participate in the study.

I understand that significant new findings developed during the course of this research, which may relate to my participation will be made available to me.

_____	_____	_____	_____
Full Name of Participant	**Date**	**Time**	**Signature/Right Thumbprint**

I, _____ (name of researcher) herewith confirm that the above participant has been fully

Informed about the nature, conduct and risks of the above study.

_____	_____	_____
Full Name of Researcher	**Date**	**Signature**
_____	_____	_____
Full Name of Witness (If applicable)	**Date**	**Signature**
_____	_____	_____
Full Name of Legal Guardian (If applicable)	**Date**	**Signature**

ANNEXURE H

LETTER OF INFORMATION

Dear Participant

Thank you for participating in this study.

Title of the Research Study:

Perceptions of the academic librarians on the use of mobile technology to provide library services in the UoTs in KwaZulu Natal.

Principal Investigator/s/researcher:

Muvhulawa Romeo Matumba, BTech Degree in Library and Information Studies.

Co-Investigator/s/supervisor/s:

Dr Mogiveny Rajkoomar, PHD in LIS

Purpose of the Study:

The main aim of this research is to investigate the perceptions of the academic librarians in the UoTs in KwaZulu Natal on the use of mobile technology in providing library services. The study intends to identify and explore the various factors contributing to the adoption of mobile technology by academic librarians. Furthermore, it is hoped that this study might also assist in identifying various library services that academic librarians are providing via mobile technology, understand various challenges faced by academic librarians in using mobile technologies to provide services, as well as to collect the views of academic librarians concerning their role in providing services accessible via mobile technologies.

Outline of the Procedures:

The researcher will conduct interviews with participants at the Durban University of Technology and the Mangosuthu University of Technology. This study will apply a qualitative method. Semi-structured questions will be used to interview participants.

Due to the current pandemic, the researcher will conduct online interviews to avoid any physical contact with the participants. Microsoft Teams (MS Teams) will be used to conduct

the interviews with participants. Individual interviews will be scheduled at a time that is convenient to the participant. Participants will be asked permission to record the interviews. Interviews will be recorded using the MS Teams recording feature. Interviews are planned to take place between 9 September 2020 and 9 October 2020. The researcher intends to spend a maximum of 1 hour with each interview. The meeting will be scheduled at a time that is convenient for the participant. Participation in this study is voluntary and no one will be obliged to participate. The researcher undertakes to adhere to all the ethical principles of the research. The participants will be asked to sign the information consent, before participating in this study.

Risks, discomforts to participants:

There will be minimal risks to the participants. Participants will be interviewed online.

Benefits:

This study will benefit the participants and other academic libraries in the UoTs in South Africa, in identifying benefits of using mobile technology as well as challenges faced by academic librarians while providing library services in today's' world using today's technologies. The study will also encourage academic librarians in the UoTs to understand their strengths, weaknesses and gaps to be filled within their library profession, to improve services. The benefit to the researcher will be the publication, conference presentations and completion of a master's degree in Library and Information Sciences.

Reason/s why the Participant May Be Withdrawn from the Study:

Participation in this study is voluntarily and the participants may withdraw from this study at any stage. No reasons will be required from participants who wish to withdraw.

Remuneration:

Participants will not receive any rewards for their participation. Participation will be completely voluntarily.

Costs of the Study:

There are no costs to the research participants.

Confidentiality: the researcher ensures participants of the following guarantees:

To maintain confidentiality and security of all responses provided during interviews

To protect their rights and welfare i.e. to ensure there is no harm or victimization because of their participation in this research.

To make the findings of this research to be available on request.

All records of interviews will be stored securely and deleted after 5 years

Research-related Injury:

The researcher assures participants that there will be no injuries.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher Mr M.R. Matumba on : 073 9887356/ 031 373 5247 email: muvhulawam@dut.ac.za, my supervisor Dr M. Rajkoomar on: 031 373 6776 email: mogier@dut.ac.za the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported to the DVC: Research, Innovation and Engagement Prof S Moyo on 0313732577 or moyos@dut.ac.za

General:

Participation in this research is completely voluntarily. This research will be conducted in English. The participants from the targeted population are familiar with the English language and no translation will be required.

ANNEXURE I

Turnitin Originality Report

Processed on: 06-Sep-2021 14:28 SAST

ID: 1642444193

Word Count: 25805

Submitted: 1

Perceptions of Academic librarians on the use of mobile technology to provide services at the UOTs in KZN By Muvhulawa Romeo Matumba

Similarity Index

5%

Similarity by Source

Internet Sources:

4%

Publications:

2%

Student Papers:

2%

< 1% match ()

Neerputh, Shirlene.. "Developing guidelines for performance appraisal of subject librarians in KwaZulu-Natal academic libraries", 2004

< 1% match ()

Gaqazele, Constance Yandisa. "An assesssment of skills development programmes for selected employees: the case of Amathole District Municipality", Faculty of Arts, 2013

< 1% match ()

Omopupa, Tunde Kamal.. "Information behaviour of medical faculty in the tertiary health institutions in Kwara State Nigeria.", 2016

< 1% match ()

Ndahimana, Paul. "The prevalence and management of low back pain among high school children in Nyamasheke District, Rwanda", University of the Western Cape, 2011

< 1% match ()

Sebelego, Ida-Keshia. "RADIOGRAPHERS' UTILISATION OF RADIOGRAPHIC CRITIQUE OF ROUTINE SHOULDER PROJECTIONS", Bloemfontein: Central University of Technology, Free State

< 1% match ()

Cox, Sanet. "A framework for e-Learning support to language lecturers at a university of technology", Cape Peninsula University of Technology, 2019

< 1% match ()

Tilolo, Lwazi. "Perceptions of indigenous people regarding mental illness at Cacadu district in the Eastern Cape province of South Africa", Faculty of Science & Agriculture, 2016

< 1% match (student papers from 10-Oct-2016)

Submitted to Tshwane University of Technology on 2016-10-10

< 1% match (student papers from 27-Mar-2012)

Submitted to Tshwane University of Technology on 2012-03-27

< 1% match (student papers from 03-Apr-2012)

Submitted to Tshwane University of Technology on 2012-04-03

< 1% match (student papers from 19-May-2014)