



**UNIVERSITY OFTM
KWAZULU-NATAL**

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**Embracing Changes in Technology: A Case Study of the University of
KwaZulu-Natal Libraries**

By

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**A Dissertation Submitted in Fulfilment of the Requirements for the Degree of
Master of Commerce in Leadership Studies**

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College of Law and Management Studies

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2018

DECLARATION

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ACKNOWLEDGEMENTS

- There are a few prominent individuals who deserve special words of gratitude for their sterling contribution throughout this research work. I first wish to thank my Lord and Saviour Jesus Christ, for giving me life and courage to initiate this research work. It is by His grace that the following persons, without whose assistance this research work would not have been completed, became part of my life:
- My stunning supervisor Dr Cecile Proches, who encouraged me to continue working on this project even when I felt like giving up. I am grateful for her professional advice; always encouraging me not to panic, and for being so tolerant. May the good Lord richly bless and increase you.
- My colleagues, Dr Richard Beharilal, for your support and assistance in the duration of this research study, and Mrs. Anita Somers and Ms. Pravina Laljeeth for your continual support. I can never thank you enough.
- Leadership of UKZN Libraries, without you this work would not exist. Thank you so much for agreeing to be part of this study.
- Finally, my mom, Ms. Pamela Ndlovu, thank you so much, woman of God for never complaining about the late nights I spent on campus working on this research study. To my 5-year-old daughter, Nizenande Mabaso, thank you so much. You will understand one day why Mommy had to leave you.

ABSTRACT

The involvement of current technological advancements in an academic library has influenced changes in collecting, storing, and managing information. The study investigated changes in technology and to what extent staff are embracing the ever-changing technologies at the University of KwaZulu-Natal (UKZN) Libraries. Academic libraries have been around for many years, they are as old as the academic institutions they serve, and are traditionally considered collections of information sources and storehouses of books. Today the idea of the library as just a 'storehouse of books' has changed, and people now generally understand that the library plays an essential role in making the successful research output of an academic institution possible. Technology has changed the expectations of library users; people of today expect to be able to find and access information from wherever they are. The ever-changing technological environment has meant that academic libraries must adapt to the demands of the users in an attempt to create services that enrich user experience and meet the strategic goals of their institution. The study adopted a qualitative research approach and purposive sampling technique. Sixteen participants, which included top management, middle management and senior/professional librarians participated in the semi-structured, in-depth interviews, recorded on audio. The data collected were analysed using thematic analysis. The key findings were that staff were resistant toward changes in technology, and that contributed to the challenges faced by management. It was found that management wants to remain relevant to the current technological hike. Therefore, it is crucial that UKZN Libraries embraces the changes that come with technology to remain relevant to the ever-changing needs of its users.

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LIST OF ACRONYMS AND ABBREVIATIONS

APP	Application
EGM	Ernie Gideon Malherbe Library
Going 'e'	Electronic (online library)
ICTs	Information and Communication Technologies
LIASA	Library and Information Association of South Africa
LIS	Library and Information Services
LP	Long Playing (sound storage medium also known as vinyl record)
OPAC	Open Public Access Catalogue
UDW	University of Durban Westville
UJ	University of Johannesburg
UKZN	University of KwaZulu-Natal
UN	University of Natal
UNISA	University of South Africa
UP	University of Pretoria
WITS	University of Witwatersrand
WMS	WorldShare Management System

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Academic libraries have been around for many years; they are as old as the academic institutions they serve and are traditionally considered collections of information sources and storehouses of books. Today the idea of the library as just a 'storehouse of books' has changed and people now widely understand that the library plays an essential role in making the successful research output of an academic institution possible.

Technology has transformed the prospects of library users; people today want to be able to find and information from the comfort of their homes or offices. The involvement of current technological advancements in an academic library has influenced changes in collecting, storing, and managing information (Wales, 2014). The ever-changing Information Technology (IT) environment has meant that academic institutions, especially libraries, need to adapt to the demands of their users in an attempt to create services that enrich the user experience and meet the strategic goals of libraries (Kenan, 2012). Hence, the study investigated whether UKZN librarians are embracing changes in technology.

The purpose of this chapter is to expound on the research problem, explain the purpose behind the study and briefly describe the methodology employed for the study. A brief description of the structure of each chapter will be discussed to provide a synopsis for the chapters that follow.

1.2 Background and Context of the Study

The study focuses on UKZN, which is spread across five campuses and comprises four Colleges between Pietermaritzburg and Durban. The formation of UKZN took place in 2004 when the then Minister of Higher Education, Professor Kader Asmal, announced the merger of the Universities of Natal (UN) and Durban-Westville (UDW), in terms of the Higher Education Act 101 of 1997 (as amended). This merger sought to create a regional university that would be managed by a single unitary council (UKZN, 2015).

According to UKZN (2015), the institution has grown steadily in terms of overall student numbers over the past three years, which in 2015 totalled 45,683 students. UKZN has libraries on all campuses to support the academic programmes of the university, thus the name UKZN Libraries (UKZN, 2016a). Users are students, academics, researchers from South Africa, as well as the entire continent of Africa, and international visitors from beyond Africa. Figure 1.1 below, shows the five campuses of UKZN.

Figure 1.1 Five campuses of UKZN



Source: adopted from UKZN website (2016)

UKZN Libraries and its branches include:

- **Edminson Library at Edgewood Campus** – The Library was established in 1980, it was named in honour of Mr. E S Edminson, rector of Edgewood College from 1969 to 1974. The library assists with information needs of staff and students for the discipline in the School of Education. Other subject matters attended to are: Development Studies, Leadership & Management, Education Studies, Language and Arts, Mathematics and Computer Science in Education, Social Science Education, as well as Technology in Education (UKZN, 2016).
- **EG Malherbe Library at Howard College** – The Main Library attends to the needs of staff and students in the humanities, social sciences, development disciplines and engineering. It was entitled the EG Malherbe in 1988 after the institution's former principal, who guided the University college to full institution of higher

education status in 1949 (UKZN, 2016). There are three other branches on the Howard College Campus that stock resources for architecture, Law and Music.

- **Medical School Library** – located at Nelson R. Mandela School of Medicine, it was formed in 1954 and attends to the information needs of staff and students in the Faculty of Health Sciences. The library also caters for the branches of its sister campuses. Amongst the facilities that the medical library offers, there's an online service called the Victor Daitz Library for HIV/AIDS information gateway. The online portal provides access to a collection of methodical literature on HIV and TB (Victor Daitz Foundation, 2016).
- **Westville Main Library** – It was established in 1961 and was situated formerly at Salisbury Island in the port of Durban, South Africa. It was then moved to Westville when the University of Durban-Westville was relocated. The Library assists with the information needs of students, staff and researchers in the Commerce and Management Sciences, Health Sciences, and the pure Sciences (UKZN, 2016). The Westville main Library has a branch library called the Joe Ryan Dental Library, located on the ground floor of the Oral Dental Training Hospital part of King George V Hospital. The Library contains all recent dental and medical materials, including journals as well as printed books. The library stock is limited, but it encompasses a very informative cluster for any dental student or user.
- **The Pietermaritzburg Library** – also known as the Cecil Renaud Library, it services the needs of researchers and students in the School of Education, Training and Development; Management Sciences; School of Chemical and Physical Sciences; School of Mathematics, Statistics and Information Technology; the School of Environment and Development and the Faculty of Humanities disciplines. The library was titled after Cecil Renaud in 1990 after he contributed funds for the building of a second floor of the library.

The Pietermaritzburg Cecil Renaud Library has two branch libraries namely: the Life Sciences Library and the Law Library. The Life Sciences Library offer information sources

to researchers and students for the three schools within the College of Agriculture, Engineering and Science. The Law Library covers a range of books on local and foreign law, law reports, statutes and journals in both print and electronic formats. It attends to the needs of staff, researchers and students of the Faculty of Law, as well as the legal fraternity of greater Pietermaritzburg (UKZN Libraries, 2016).

Additionally, there are four special collection archives under UKZN Libraries. The special collections are of regional and national interest, they are the Killie Campbell Africana Library in Durban, the Alan Paton Centre and Struggle Archives in Pietermaritzburg, as well as the Gandhi-Luthuli Documentation Centre in Westville. The special collections and the libraries together have more than 1.4 million volumes of artifacts, journals, books, theses, reports and many printed and online materials. There is an audiovisual collection and a growing number of online resources that can be retrieved via the library's webpage by registered students and staff of the university (UKZN Libraries, 2016).

Embracing changes in technology was the overall focus of the study. Changes in technology within the whole institution have been taking place since the introduction of the Moodle e-learning 2016-2018 policy framework by UKZN (UKZN, 2015). The study looked at the policy framework to see what changes can be put in place in the library to support the e-learning curriculum within the institution. According to UKZN's 2016 undergraduate prospectus, students will require the use of technological devices in order to access an online learning system (UKZN, 2016b).

In an attempt to create services that enrich the user experience and meet the institution's goal, UKZN Libraries has had to come up with innovative ideas as well as implement technological-system changes so as to be on par with the progress of the whole institution (UKZN Library, 2015). Thus, the study investigated changes in technology within the academic library sector. According to Anglada (2011), one of the effects of the Internet is that it has increased cross-border relations. Brundy (2015) argues that technological advancement issues at university libraries cannot be approached in isolation but must be dealt with through alliances.

1.3 Problem Statement

The 21st century student is more abreast with technology than ever before, and information, amongst other things, is increasingly being accessed in electronic format (Cassidy, Colmenares, Jones, Manolovitz, Shen & Vieira, 2014). A study done by Abatan and Ajayi (2016) about UKZN, stated that students understand and are fully aware of the use of mobile telecommunication services the study further suggested that technological applications such as mobile telecommunication technology and its services could serve as an important educational tool in higher education institution. It has emerged that as much as students are aware of technological changes, UKZN libraries seemed to lag behind.

Parallel to the technology trends in universities is the reality that South African Higher Education funding has significantly decreased over the years and by default, UKZN Libraries's budget has been negatively affected, thus making it harder for the library to implement current and relevant technologies. Price Water Coopers (2013) state that the government's contributions to university education dropped from 49% at the start of the century to 40% by 2012, while student numbers preregistration got bigger from 24% to 31% throughout the same period. As a result of a decrease in the government's contributions to universities, funding that goes towards library services has been noticeably reduced (Hoskins & Stilwell, 2011). Academic library management is consequently left with a challenge of having to come up with innovative ways to keep up with trends in the current technological hike, but at the same time having to do that with unsatisfactory funding.

According to UKZN (2016b) there is high demand for library facilities that are conducive and "speak to" the current students of UKZN. Rendón (2015) maintains that technology has taken over and changed the way people use academic libraries; libraries have become hubs of technology, hence students can do much more than just borrow books from the library. The current situation at UKZN Libraries is that the demands from users are not met, as they require current technologies to access library services. Raju (2014) states that academic library management are faced with many challenges amongst others, access to the online library, the availability of all information sources online, and

off campus access. Technological development in the library such as accessibility of online resources has made the distribution of knowledge resources wider and more effective and in turn, serves library users even better (Meghini, Spyrtos, Sugibuchi & Yang, 2014).

According to a study by Baro, Ebiagbe and Godfrey (2013) it emerged that librarians in South African universities use various technological applications and software frequently, which might be true for UKZN librarians, more than librarians in university libraries of other African countries. Some of their findings suggested that librarians might be lacking skills, awareness of emerging technologies, or simply lacking interest, therefore leaving them unwilling to embrace technological developments. This study aims to investigate whether this is true for UKZN librarians. As part of an institution, the library needs to assess available resources, the needs of resident scholars, and find the right balance between print and online material in order to support the parent organisation's development and progress (Yang, 2014). One of the possible solutions that can remedy the challenging technological issues faced by university libraries is collaboration, to ensure relevant services are delivered to users (Anglada, 2011). In order to embrace changes in technology, collaborations are a good step forward. This change does not only affect library services but it can help boost the University's standing at both national and international level.

1.4 Significance of the Study

The study pursued to uplift the role of Information Technology platforms in library services in improving the library upkeep at UKZN. The research seeks to bring to the fore challenges faced by management in discovering innovative ways to keep abreast with technological advancements in the library sector. In this way, the study is understood as having concrete usefulness for UKZN Libraries as it may enrich the current procedure and future practices regarding online accessibility of its libraries.

1.5 Aim and research questions of the study

The study intended to investigate the extent to how UKZN Libraries was embracing changes in technology as part of ensuring the university becomes the premier university of African scholarship. Key research questions which emerged in terms of this aim were:

- How can UKZN Libraries adapt to technological changes in teaching and research?
- What changes are required to make UKZN Libraries more competitive, user-friendly and useful to the end-user?
- How can technological changes be embraced at UKZN Libraries?
- How can library staff be capacitated to embrace change in technology at UKZN Libraries?
- What are potential areas of resistance to change that may be experienced in implementing technological changes at UKZN Libraries?
- What strategies can be identified to facilitate change in technology at UKZN Libraries?

1.6. Study Objectives

- To establish if UKZN Libraries can adapt to technological changes in teaching and research.
- To analyse changes required to make UKZN Libraries more competitive, user-friendly and useful to the end-user.
- To determine how technological change can be embraced at UKZN Libraries.
- To assess how library staff can be capacitated to embrace change in technology at UKZN Libraries.
- To determine potential areas of resistance to change that may be experienced in implementing technological changes at UKZN Libraries.
- To identify strategies that can be used in facilitating change in technology at UKZN Libraries.

1.7 Delimitations

The following delimitations of the study were noted:

While this research focused on UKZN libraries which includes Westville, Howard College, the Medical School, Pietermaritzburg and Edgewood libraries, the study did not include branch libraries at UKZN. UKZN libraries consists of 19 libraries in total, but due the nature of this particular study where the emphasis was on management and higher level staff, hence the study was confined to 5 main libraries. The major delimitation of the study was that lower level staff of UKZN Libraries were not included.

1.8 Preliminary Literature Review

The literature adopted concepts mainly from the change management approach, which convey any alterations of actions in an organisation or institution. Cameron and Green (2015) describe change management as any method that transitions individuals, teams, and organizations using approaches intended to re-direct the use of resources, business practice, budget allocations, or other means of operation that significantly remodel an organisation. In actuality, the modification of activities can include nearly any facet of the organisation, including technological advances and overall organisational streamlining which could affect the duration of how management does the compilation and carrying out of work schedules (Dasborough, Lamb, & Suseno, 2015).

Information facilities like academic libraries have continuously been influenced by changes in their settings; this being the situation, information facilities are required to change, posing a puzzling factor to executives who have to see to it that the challenges are appropriately dealt with (Molaudi & Du Toit, 2010). Cameron and Green (2015) further state that change management is an efficient approach to dealing with change both from the standpoint of an institution and the individual. Change studied at the organisational level includes rational and intentional contrivances to effect strategic initiatives that create new viewpoints (Campbell, 2014).

A persistent factor in today's progressively global information-services industry is change. New technologies bring improvements and new user bases arise, therefore a collaboration between the two institutions might bring about good change. The immediate change in management is important and evolutionary. It is their change of thinking that creates new values within an organisation (Jantz, 2012). For UKZN Libraries' personnel

to accept change being brought by collaboration, management first needs to understand and anticipate the change that's envisaged. Molaudi and Du Toit (2010) agree that most, if not all, information services certainly face the necessity of transformation. Change could reveal the impact of environmental conditions, which may span from technological, political and monetary factors to educational factors, and further sociological factors and global influences. The fundamental aspect of the system of change is the administration thereof and the acknowledgment of the need for top management to be dedicated to the process of change if it is to be fruitful. The current study intends to focus on technological implementation factors that will enable embracing change within UKZN Libraries.

Librarians identify that change especially rapid changes in the technological sphere such as how knowledge has become easily accessible, has become an integral part of libraries and information services today. Library executives are no longer the ones who must be able to successfully manage change but all library staff including professional librarians (Gallacher, 2000). Although change may be a laborious implementation the fact is, it is an experiment that information services have to face because the objective is to improve or amend the performance of the organisation, such as academic libraries. One of the striking things about change in information services is that it has become a norm. Pugh (2007), further asserts that the nature of change in library and information services has advanced within the Web, which has resulted in the emergence of what is referred to as Web 2.0 and, more recently in the library context, Library 2.0. It is this development which has added a new dimension to library services, characterised by user contribution and interaction (Jantz, 2012).

The involvement of technology in libraries has made a huge difference to the services offered, therefore the initiative to improve and move with the current trends is thus unavoidable (McKinlay & Williamson, 2010). Libraries are currently in the midst of a paradigm shift. Until quite recently, a library's primary resource was its collections (Brundy, 2015; Cameron & Green, 2015; Cassidy et al., 2014; McKinlay & Williamson, 2010). The primary resource now lies in the expertise and service performance of library staff. As with any business where services can be accessed from a variety of sources,

people are the differentiating factor that relates directly to relevance, return on investment, funding, and future roles (Du Plessis & Mabunda, 2016).

According to Cawthorne (2010) effective leaders who manage intricate organisations often rely on the expertise and capabilities of subordinates at all stages in making and carrying out resolutions. By motivating the involvement of junior team in decision-making, senior management exercise shared leadership. Such leadership is demarcated as the self-motivated, interactive influence development, involving more than just the descendent influence on junior staff (Duren, 2013). Shared leadership is therefore distributed amongst a group of people instead of being fused within one person.

Riggs (2011) stated that academic libraries were impartially slow in changing the methods of doing business in the earlier decades. The same could be believed, in general, about establishments of higher education. These establishments are still perceived by many to behave and function in an out-of-date manner (Cassidy et al., 2014). Academic libraries are adapting much faster than their particular parent institutions; essentially, everything now and about the library is changing, including facilities, technologies, structural concepts, ownership and access procedures, principles, and more (Chiwane & Mathe, 2015). This research was to examine if the same was true for UKZN Libraries.

1.9 Research Methodology

This study adopted a qualitative approach. The qualitative method used was chosen over quantitative research because it allowed the researcher to deal directly with people who are involved and most of them have first-hand experience in the phenomena investigated. Quantitative research instead deals with numbers and relies on its interpretation from given statistics and data collected from various sources that determine if what is being observed might be explained by a currently existing theory (Sekaran & Bougie, 2013).

Qualitative research aims for thorough understanding where the variables are not measured, and the use of qualitative methods are commonly categorized as being interpretive and independent (Creswell, 2013). The researcher had an opportunity to interact with both top management and senior staff (senior staff includes line managers and professional librarians) using the language that they understand. This is important

because it gives respondents an opportunity to relax and speak freely. The researcher can provide support by giving respondents a chance to reflect on their experience in the issues being discussed, whilst feelings are observed, which in turn can assist in the interpretation of data collected (Leedy & Ormrod, 2014). Data collection included interviewing participants with the view to collecting data and determine the respondents' attitudes in relation to the topic at hand. Ethical clearance in terms of the UKZN requirements was adhered to, which included informed consent signed by the participants and the researcher, thus ensuring the participants' protection and willingness to participate.

Thematic analysis was used. Kumar (2011) emphasises the importance of transcribing the responses of the participants for data analysis, and noting any new themes that may come up on the research topic. The data was analysed utilizing a thematic approach. This was based on an inductive method where patterns in the data were isolated by means of thematic codes, which became major themes that were reflected in the findings of the research (Creswell, 2013a). Chapter Three covers the methodology used in this research in detail.

1.10 The Structure of the Study

The study was commenced with an approach that permitted a clear understanding of the problem being examined, backed by an academic background and review of literature. An explanation of the methodology was offered, as well as the presentation and analysis of information and final recommendations and interpretations was also done. The study is organised according to the subsequent format:

Chapter One:

The chapter presents the research problem, explains the background of the study, outlines the research methodology that will be used, outlines the research questions to be answered and also informs on the limitations of the study.

Chapter Two:

Chapter two focuses on the literature review. In this chapter, an overview of the challenges affecting academic library managers, and dealing with change is provided; innovation in academic libraries, technological advancement in-depth, as well as e-learning, is also outlined.

Chapter Three:

This chapter describes the research methodology and data collection techniques as well as the data analysis used in the study. It outlines the sampling techniques, the research instrument used to collect the data from participants, and the methods of data analysis.

Chapter Four:

Chapter four represents the findings of the interviews conducted with the respondents as well as the results. Participants included management and some key senior staff of UKZN libraries.

Chapter Five:

This chapter delivers a discussion and explanation of the research results of the study. The outcomes of the study are also compared and compared with results of previous similar studies.

Chapter Six:

The chapter links the ideas of the study with the findings. It gives a detail outline of whether the research questions have been answered and offers a list of confirmation that shows how the research questions has been responded to. It also deliberates how the identified recipients will benefit from the conclusions of the study. It provides recommendations on how to address the study problem, it summaries the limitations identified in the research and offers resolutions on how to overcome these boundaries. The chapter also gives a brie outline that states whether or not the study answered or solved the research questions.

1.11 Conclusion

The chapter draws a brief account of how technology in academic libraries has changed the way librarians disseminate information to their users. It further points out the purpose for such a study and contextualised it in relation to the problem statement. The methodology used for the aim of the study and the limitations of the study are discussed. It was envisioned that the findings from this study could contribute to improving the current technological devices and eventually contribute to enhanced service delivered by the library. The next chapter details theory drawn from previous studies in a literature review, changes in technology in the perspective of academic libraries are highlighted, the latest trends and studies on this subject are discussed.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

As indicated in the introductory chapter, the aim of this study was to examine the impact of technological developments and how the senior staff and management such as: executive managers (library management), senior managers (line managers) as well as middle management (subject librarians) have embraced the changes in a case study of UKZN Libraries. Technological developments have been implemented in academic libraries for many years and university libraries have become increasingly entwined with technology. Examples that show evidence of the academic library becoming a technological hub range from online catalogues to the merging of computing labs with the library.

This chapter provides an overview of technological initiatives in academic libraries and it will detail what UKZN Libraries encompasses. The chapter highlights best practices in the library sector internationally, and in South Africa especially, technological advancements and innovation in the academic sphere. Lastly, the chapter will look at change management as the underpinning theory of the study. Where suitable, the works is reviewed from the international viewpoint, to the African setting and finally down to South African context. Sources looked up include published and unpublished articles; online conference papers and printed books in both hardcopy and online.

2.2 The Concept of Change

Ranganathan (1957:350) stated, "The library is a growing organism" which meant that a library is a continually changing institution. Growth involves change, and academic libraries are faced not only with an astonishing rate of change, but they also face very real challenges to their existence in the modern society. Change is defined as an empirical observation of difference in quality of state over time (Nicholson, 2015). Change is a transition of current state to desire state, the management of that transition stage is called management of change Cameron and Green (2015). However for this particular study, change is defined as means to evolve and innovate so as to be currently abreast with the modern technologies. In libraries change does not only include information technology however, but also resources and services, culture and values, strategic planning, decision

making, translating vision into achievable targets and operations and evaluation (Shan and Maqsood, 2013).

2.3 Technological Advancements in libraries: the evolution

Technology has altered the face of libraries, and is continuing to modification of how librarians work and deliver services to library patrons (Cassidy et al., 2014). This section will examine the methods in which information technology improvements have transformed the academic library over the last few decades. Lynch has written largely on the issue of technological trends; there is a wealth and captivating early account of information technology in libraries, starting back from the 1950s and early 1960s as part of the revolution in science and technology (Lynch, 2010). Yet for highest academic libraries, this technology first arrived in force in the late 1960s or early 1970s in the form of locally produced or commercial products intended to computerise library methods (Lynch, 2010).

McCallum (2003) adds that possibly the utmost success of this era, which persisted until the early 1980s, was the improvement of mutual cataloguing systems. Networking in a wider sense only became important in the late 1980s, whereas in the early 1970s, librarians had expected they would be able to exchange and make use of information, and that their operation difficulties would be solved through the use of common architectures provided by hardware and software producers (McCallum, 2003). These systems recognised very important growths in the use of computers and computer networking, collaboration and co-operation within the library community paved the way for other vital developments that would transform libraries in the 1980s and early 1990s. The key understanding behind shared cataloguing was that because most books bought by each research library were also purchased by other libraries, there was no reason for each libraries to pay skilled labour to independently catalogue a book and prepare cards for its card catalogue (Lynch, 2010). Instead, clusters of libraries used large, consolidated databases operated by external organisations.

Libraries applied an increasing range of information technologies to the management of collections of predominantly print information (Martell, 2012). Starting in the late 1980s or

early 1990s, academic libraries were met with environmental ups and downs driven by information technology, which quickly moved the emphasis and the attention away from automation (computerisation) toward a series of much more essential questions about library roles and operations in the digital age (Raju, 2014). Libraries were now obliged to react to improvements in Information Technology. The advent of the World Wide Web in the mid-1990s is perhaps the ultimate symbol of this shift, with all of its implications for academic communication; but there is considerable more, namely, the rise of computational science, and the new role of databases in all areas of learning (Chisa & Hoskins, 2014).

In the late 1980s, the world of academic communication, teaching and research began to transform as a result of networking and advanced Information Technology. The library moved in a decade characterised by an massive peak of invention, creativity, and experimentation (Lynch, 2010). Networked information arose with an enormous amount of collections in online content, and services were now reachable through the network at any time, from anywhere. This meant that digital information could be used and recycled, navigated and assimilated, as well as personalised to the needs and intents of each user.

Towards the end of the 20th century, there was a significant development in libraries with the introduction of combined library systems and online catalogues that were able to offer access to information on library collections, using an internet connection from wherever the user might be (Brown & Osborne, 2012). According to Jantz (2012) libraries have always been antagonistic adopters of computerisation. They have been more uncertain and unwilling to adopt innovation, although every so often they have good cause for attentiveness.

Jantz (2012) states that at the beginning of the new century, libraries were slow to adapt to innovation and recognise the implications and meanings of conversion. Libraries were now having to turn their consideration to defining their missions and actions in relationship to their transforming setting — the information technology revolution in teaching, learning, and research (Jantz, 2012). Changes in scholarly communication practice, presentations

of instructional technology, and expansions in intellectual property law will shape much of the upcoming state of the academic library (Lynch, 2010).

Academic libraries have come a long way since the early beginnings of tertiary institutions. The library's function has always been to acquire resources, organise, preserve, and make them accessible to patrons (Dale et al., 2011). The forms of those resources have changed over time: from scrolls, illuminated manuscripts and hand-crafted parchments to Long Players (LP - an analogue sound storage medium in a vinyl record format) and laser-discs, to e-books, electronic databases and open data sets. The evolution of the publishing industry has meant that the library also evolves with the rise of IT and its webs of wires, protocols and regulations. At every stage, the contexts — spatial, political, economic, and cultural — in which libraries function, have shifted; they are continuously reinventing themselves and evolving in the way they provide those vital information services.

2.4 Technological advancements in academic libraries

Academic libraries are positioned around teaching and learning in institutions, and are opposed by vast pressures that necessitate them to respond and adapt in the demand to remain significant (Jantz, 2012). Rapid advances in technology, as well as adjustments in areas such as scholarly communication, data administration, and higher-education instruction are enforcing user expectations and compelling academic libraries to develop new resources and service areas (Saunders, 2015). Libraries have productively adapted the online activity, taking prospects to meet their users' contemporary requests and needs. Remote accessibility to sources and devices have become digital additions of traditional library structures, collections, and services (Gruca, 2010).

Nowadays, libraries must balance new inventiveness with core service areas concurrently, such as training and collection development. In addition to answering to existing trends, academic libraries are also being confronted to anticipate future needs and to develop ground-breaking initiatives to meet those requirements (Saunders, 2015). Molaudi and Du Toit (2010) state that the participation of technological development in the academic library has predisposed changes in collecting, storing and organizing

information. According to Hsiao and Tang (2015), technological development has also made the distribution of knowledge resources wider and more functional, therefore serving library patrons even better. Unlike the libraries in the past that contained only print material, current libraries are thought of as having a broader access to information and awareness in many formats and from many sources.

Research has pointed out that circulation of traditional materials in university libraries is declining at many academic libraries (Hsiao & Tang, 2015). In contrast to this declining physical usage of libraries worldwide, the move toward e-books has been increasing among the younger generation because they tend to read books on computers or mobile devices such as tablets and smart-phones. According to a survey of public libraries in Taiwan, while paper-based book borrowing grew by one percent per year, the digital items downloaded grew eight percent with an average of 2.6 items checked out by each person (National Central Library Annual Report, 2012b).

There has been a significant change when it comes to the way academic library users access the information. Dale, Beard and Holland (2011) point out that the stakeholders of information resources has withstood a vast amount of adjustment over the years. The authors further state that information in libraries has moved from limited access to book catalogues to card catalogues to current online catalogues with unrestricted access. All this is to support academic library users to find the required information sources available. The advent of affordable computers, personal gadgets for individual use and the development of the Internet have transformed the use of library services and the ways libraries operate (Dale et al., 2011). In order for UKZN Libraries to engage and embrace new technologies, the following discussion explores some of the technological development that the library can adapt.

Youngkin (2014) identifies academic libraries as incubators for discovering new understanding and communication technologies, and technological innovation has allowed academic libraries to deliver its users with fast, up-to-date and authoritative resources. The ease of use, access and retrieval through an array of devices, is an attractive benefit to library users (Allen & Taylor, 2017). Today, technology has a lifelong

influence on libraries. At one point, libraries were thought to be going the way of outdated bookstores; but they have recovered and are flourishing in a technology-fueled world. With advancement, re-imagination and vision, libraries are taking on new technologies while creating vibrant community hubs filled with life (Rendón, 2015). The role that UKZN Libraries plays is very vital and will continue to progress over the next decades just as it has over the previous years. Allen and Taylor (2017) claim that librarians must also be conversant and at ease with the use of these newly-introduced technologies.

2.5 Mobile devices and the virtual services of academic libraries

The use of mobile devices to access and search for information is growing extensively and it has reformed the old-fashioned academic library beyond recognition (Vassilakaki, 2014). Raju (2014) maintains that these dramatic changes have meaningfully affected the knowledge and skills requirements of library professionals practicing in the academic libraries' environment. Unlike previous changes in technologies such as from filmstrip to video, the transformation to searching information on smartphones carries with it an fine-tuning in search behaviours by patrons (Walsh, 2012). These changes offer an opportunity to reassess library services and their users' access to available information. The Internet access from portable devices has transformed not only the way individuals communicate, but similarly has affected the way users search, find and use information to assist in their daily needs (Yang & Li, 2016). Bell, Peters, Peters and Bell (2013) state that librarians have to make the services they offer to users as mobile open as possible. In their study, Paterson and Low (2014) find that librarians have quickly realised the need to provide library websites which can be reachable easily via mobile devices, as their users are using mobile handsets instead of laptops and desktops to search catalogues, check the library's opening hours and keep contact with library staff.

Web services and technological devices are shaping the library sector, especially the academic library today. There has been an increase in services that can be accessed through mobile devices. What has also emerged are libraries whose services can now be accessed using mobile phone technology, where teachers and learners have a "library" in their pockets to access information anytime and anywhere (Isibika, 2013). This rapid dispersion of mobile technology, particularly among students and teenagers, has clearly

brought several prospects for business, social and educational services, with the latter including libraries (Bomhold, 2014). On another front, there has been a general decline in the physical usage of libraries worldwide, adding to the move toward the usage of technological devices to access library services such as e-books (Hsiao & Tang, 2015). The usage of e-books has been increasing among the younger generation because they tend to read books on computers or mobile devices, such as tablets or smart-phones (Hsiao & Tang, 2015).

Mgquba and Underwood (2016) explain that mobile technology, as part of the new technologies embraced in different sectors worldwide, has changed and had a significant effect on the way people live, work and play. Liang, Huang, Yeh and Lin (2007) define mobile technology as referring to any communications, either direct or indirect, via mobile devices, such as phones or personal digital assistants. Mobile technologies are characterised by their small size and portability (Aharony, 2012). These technologies change the way people communicate since they provide many options on a single device. Examples of such options are information searching and retrieval, information sharing and dissemination, instant messaging, and many others (Bozalek et al., 2013).

Social networking capability is one of the features leading to the increased use of these technologies. Peacemaker, Robinson and Hurst (2016) posit that one cannot overlook some of the limitations in using advanced technologies, such as low storage memory for some mobile phones. Mobile phones' screens are too small to use for reading purposes and battery life may not be long enough to support long usage of the phone (Schnitzer & Rosenzweig, 2016). Mobile devices have added another characteristic to the librarian role, one that involves new abilities, skills and knowledge to make certain that the needs and expectations of users are met (Saravani & Haddow, 2011). However, it is important to note that library and information services are not just about providing these services to users on their mobile phones, but ensuring that those services being provided are meeting the users' information needs. Institutions cannot lose sight of the importance of applying technological advances such as mobile technology as they plan for the future of their intellectual facilities. Universities will be most successful in empowering their libraries if they not only provide solutions for existing needs, but also ensure their facilities can

respond to future changes in teaching and technology (Brundy, 2015). As mobile technologies continue to change and advance in developing countries, libraries, especially professional librarians, may be best positioned to assist students and researchers in accessing information required, as they are experts in producing and retrieving relevant scholarly materials without physical boundaries (Allen & Taylor, 2017). In the last couple of years there has been an emphasis on the provision of accessible information services on cellphones and tablets; a variety of different systems, platforms and technologies were developed in an effort to provide mobile information services (Vassilakaki, 2014). The ultimate goal is for libraries to offer effective information services in a new, mobile environment and thus successfully meet the needs of their mobile users.

2.6 Library 2.0

The term Library 2.0 was first used by Michael Casey on his Library Crunch blog in 2005, where he explains how Web 2.0 can be used in the library to empower the users, encourage constant change, and reach those who do not use libraries (Casey & Savastinuk, 2013). Library 2.0 has its origin in, and has borrowed concepts from, Web 2.0 which is associated with web applications that facilitate participatory information sharing, inter-operability, user-centered design and collaboration on the Web (Miller, 2005). The focus of Library 2.0 is on user-centred change and participation in the creation of content. According to Cohen (2007), Library 2.0 is a new way of providing library services through new internet technologies, with the emphasis on user-centred change and interaction.

Advances within the Web have resulted in the emergence of what is referred to as Web 2.0 and, more recently in the library context, Library 2.0. It is this development which has added a new dimension to library services, characterised by user contribution and interaction (Muhambe, 2012). Library 2.0 is mainly concerned with using the Web 2.0 (associated with web applications that facilitate participatory information sharing, inter-operability, user-centred design and collaboration on the World Wide Web) opportunities in a library environment (O'Reilly, 2013).

The Library 2.0 model can be understood as a model for a modernised form of library service that reproduces a change in the library in terms of service delivery (Dewan, 2012). Today, library collections often consist of cutting-edge technology with vast collections of both online and offline resources, and the library is no longer just a place for books. In fact, rapid advances in technology are transforming libraries into the electronic information centres of our communities (Schnitzer & Rosenzweig, 2016). Librarians are continuing to look more like information-technology professionals as technology progresses. The involvement of technology in the library poses a big challenge for the library and information science (LIS) profession, since operations such as the service delivery of a modernised library (Library 2.0) are now determined by librarians having the necessary technology-related skills (Baro et al., 2013).

The internet has been an essential vehicle in terms of facilitating the technological developments we now see in our libraries. Particularly, the World Wide Web (the Web), as one of the services of the Internet, has become a crucial component for academic library services to access at such a rapid speed (Casey & Savastinuk, 2013). Meghini, Spyrtos, Sugibuchi and Yang (2013) state that today the Web is commonly believed to be the biggest digital library ever built. However, although the Web nicely illustrates some of the basic features and characteristics of a digital library, it nevertheless captures them in a rather imperfect way. Of course, this is understandable, as the Web tries above all to be simple so that casual users can access it easily. However, while being easily accessible, the Web ends up being too simple and misses some important features and functionalities that a digital library should offer (Meghini et al., 2013).

According to Kwanya, Stilwell and Underwood (2010), users no longer want to use the library as a place only to collect books or printed journals, or as a reading space; they also want their views to be heard. Based on the rise of Google, Amazon, Wikipedia and an increasing number of institutions using Web 2.0 technologies to provide information, there is an innate fear that many knowledge seekers will bypass institutions that are perceived to be slow and unresponsive in favour of a more direct approach to services (Kwanya et al., 2010). Thus, Miller (2011) suggests that one way to retain these

knowledge seekers is to keep the library updated with technological developments, such as those occurring with Web 2.0.

With the introduction of Web 2.0, librarians find themselves in the age of participation; a time when all users are technically motivated and empowered to contribute to library content regardless of their background or position (Rice, 2011). According to Tella, Tella, Oladapo and Oladapo (2016), in a comparative study done on selected Nigerian and South African universities, websites were explored to check whether Web 2.0 tools are encouraged, and it was found that South African university libraries are ahead of their Nigerian counterparts. The integration of Web 2.0 tools, e-resources, e-databases and the provision of platforms for easy retrieval of information for users are already available (Casey & Savastinuk, 2013). In order to facilitate the services for the library and to compete on an international level, UKZN Libraries should be seizing every opportunity to promote their genuinely valuable content and service delivery by using these new technological developments and embracing the technological changes in the library sector and the world.

2.7 E-learning in academic libraries

E-learning may be defined as a modern form of distance education, based on using digital devices (Gruca, 2010). E-learning is the term used to describe teaching and learning resources or experiences that are, in some way, delivered electronically (Chang, 2013). In the intellectual sphere, e-learning has sprung up in universities and private businesses, deriving the most benefits from the dynamic advancements in internet applications (Cassidy et al., 2014). Catherall (2005) defines e-learning as any technology allowing for the delivery of learning resources or communication between tutor and student. According to Meredith and Burkle (2006), e-learning as learning facilitated by the Internet and the Web technologies, that create connectivity between people and information, and create opportunities for social learning approaches. All above definitions of e-learning suggest a type of learning that is supported, enhanced or facilitated by technology and the internet.

Mgquba and Underwood (2016) state that the beginning of e-learning, as based on human collaboration in knowledge, work and innovation, can be traced to the

development of network communication in the late 1960s and the invention of e-mail and computer conferencing over packet-switched networks in 1971. According to Chang (2013), e-resources and devices have become digital extensions of traditional library buildings, collections, and services; e-learning is one of the most promising and growing issues in the information society, because of the ever-expanding Internet that is bringing online education to people in corporations, institutes of higher education, the government and other sectors. Among the most important tasks carried out by an academic library are the library services available online and those connected with its institution's purpose (Wilkin & Underwood, 2015).

The development of information technologies has deeply changed nearly every aspect of human living, especially now that the online world of social networks and electronic/ online learning has been explored (Haliso, 2011). The same is true of libraries, which have successfully adapted their online activity, taking opportunities to meet the users' contemporary requirements and needs. Darch and de Jager (2012) claim that among the most important tasks carried out by an academic library are those connected with its educational function. As an entity supporting higher education and world-class research output, the library plays a significant role in providing access to literature and information sources connected to curriculums and research (Darch & de Jager, 2012).

To be equivalent with this social conversion, libraries, particularly university libraries, need virtual spaces that allow users to interact with electronic information (Sanches, 2016). The challenges posed by these social and technological changes have forced universities and libraries to adapt. An academic library, faculty, and academic-development department which manage e-learning may use appropriate technologies to facilitate learning and access to resources and services (Sanches, 2016).

Many university students have laptops, tablets and many other smart digital devices and these gadgets are used to access information in electronic databases and to record notes in a digital format (Laurillard & Alex, 2013). The iPad has made its debut, significantly changing the educational technology landscape by becoming a major player in the field and opening the door for other tablet computing technologies (Cassidy et al., 2014). In

addition to exploring students' interactions with technologies, educators and librarians are scratching below the surface, in exploring digital content, as academic libraries will continue to be impacted by changing technologies and related standards, including mobile devices (Saunders, 2015).

In order to capitalise on the idea of continuous instant access and active engagement with students, technologies such as instant messaging, cellphone applications, e-readers, social networking, RSS feeds and podcasts can be used. In today's context of higher education, the Web is a tool for virtual teaming and collaboration, critical thinking, and enhanced student engagement (Dhamdhere, 2012). Technology allows learners to get their information wherever they are and whenever they want. Dating back as far as 2006 the growth in e-learning, where education was delivered and supported through computer networks such as the Internet, posed new challenges for library services (Pinto & Little, 2014). New information and communication technologies, as well as new educational models, required librarians to re-evaluate the way they developed, managed and delivered resources and services (Mgquba & Underwood, 2016).

According to Dhamdhere (2012), there are many different types of tools and technologies available for teaching and learning such as learning management systems, for example Moodle, Blackboard and many others. These systems are used for creating and delivering training through a structured delivery system. They allow more students to engage in exciting new ways, by reaching them on their terms through their devices and connecting more effectively, keeping students informed, involved, and collaborating (Cassidy et al., 2014). Bozalek et al. (2013) argue that emerging technologies that offer opportunities for effective e-learning platforms are those that promote collaboration, such as online databases, social networking tools and referencing tools. An e-learning environment can provide both students and faculties with a sustainable footing and continuous access to knowledge, course content, information resources, and services – all from an integrated service point (Chang, 2013). As with any new technology which brings with it a number of issues relating to social implementation and use, e-learning is no exception (Haythornthwaite, Andrews, Fransman & Meyers, 2016).

2.8 Innovation and change in academic libraries

New approaches in academic communication, expansion of the library's virtual space via knowledge or research commons; the proliferation of social media and the increasing growth of mobile devices, tablets and related applications; have collectively transformed the traditional academic library beyond recognition (Raju, 2014). Academic libraries are facing times of exceptional challenge and incomparable change; such as facilitating resource access and embedding information literacy and research skills into the tertiary curriculum using technological advancement tools (Pham & Tanner, 2014). Innovation is defined broadly as an idea, object, or practice that is perceived as new by an individual or organisational unit Rogers (2003).

According to Brundy (2015), innovation refers to:

- The action or process of innovating;
- Change, alteration, revolution, upheaval, transformation, metamorphosis;
- Reorganisation, restructuring, rearrangement, recasting, remodeling, renovation, restyling, variation.

Pham and Tanner (2014) agree that for any institution's progress, innovation is crucial, especially for its staying power and success. Few establishments, such as institutions of higher learning as well as organisations, can remain stagnant in the postmodern society – an environment characterised by rapid change in social, economic, and political influences (Wales, 2014). Beyond the boundaries of the institutions that academic libraries affiliate under, rapid changes in information and communication technologies are driving changes in the library (Gnyawali & Park, 2011). Jantz (2012) argues that competitive pressure from other organisations and institutions also affects the undeniable environmental change which requires innovation for institutions to remain relevant. Innovation has moved from being a consideration to being a necessity.

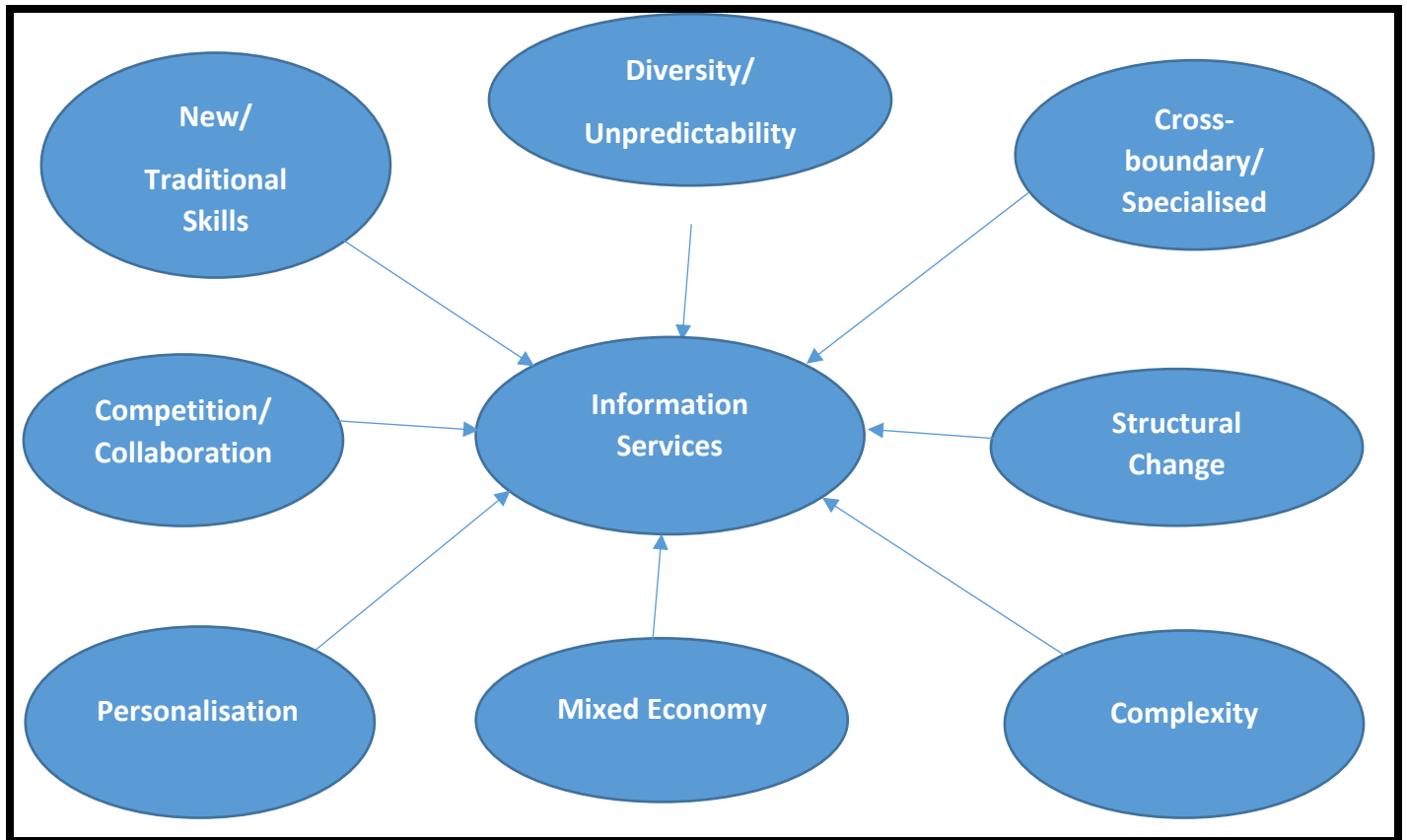
With the advancement of technology from desktops to laptops and now to mobile technologies, libraries are expected to provide cost-effective and reliable access to information, using state-of-the-art technology which is easy to use for both users and

librarians (Cassidy et al., 2014). In this study, innovation is defined as the introduction into the organisation of a new product, service, technology or administrative practice, or a significant improvement to an existing product, service, technology or administrative practice (Brown & Osborne, 2012). Gallacher (2000) evaluated and came up with the following environmental pressures that lead to change and innovation in a library:

- **Political developments** – these may be local government, new legislation for industries or government initiatives for lifelong learning, which affects all sectors.
- **Economic changes** – these may involve methods for government funding of education which profoundly affects schools and university libraries, and global or national trends such as recession and inflation.
- **Social trends** – these may include changes in population for school or public libraries; but for academic libraries pressure from social trends includes a move towards a customer focus in all services.
- **Technological developments** – these include local and international networks, electronic publishing and the advent of self-service technologies.

There is no escaping the pressures of change, whether they are perceived as having negative connotations or as opportunities. Jantz (2012) argues that academic libraries must irreversibly change. Change is their primary role, as with any information service organisation, and the changes need to come rapidly as there is a heightened focus on innovation within the academic library sphere. Librarians are faced with this technological-change phenomenon and they thus need to pace themselves with these changes. Tebbutt (2006) states that technology and the way it is approached and handled is showing its true power to enhance the change forces. He further describes the nature of change in the information services sector in Figure 2.1, below.

Figure 2.1: The Nature of Change in Information Service



Source: adapted from Tebbutt (2006: 14)

Figure 2.1 demonstrates the impact of technological change and how it has made some libraries become among the most highly diversified organisations in the world (Pugh, 2016). This is in terms of the resources they make available, and the extensive development of services which continually change with time. It is said that libraries are in the grip of discontinuous change, in the sense that the combination of change forces that is now seen is unlike anything else previously seen (Kilfoil, 2015). This change also impacts on the skills requirement of librarians today, which thus poses more challenges among academic library management.

2.9 Embracing change: the academic librarian

Change as defined by (Merriam-Webster.com, 2018) is to make different in some particular, that is to alter, secondly it is to make radically different which is transform and finally it is to give a different position, course, or direction. Moorefield-Lang (2015:108)

stated “Librarians are continuously asked to look to the newest technologies and be knowledgeable in the latest trends”, he further suggests that librarians are the technology leaders of their schools, communities, and universities.

McKinlay and Williamson (2010) believe that technology has a double-edged impact within a library; it affects each staff member because the methods of storing and retrieving information have become very dependent on technology. Kenan (2012) expands, stating that while younger staff members may be very comfortable handling new technologies, some older staff members may exhibit an inherent resistance to adapting or embracing change that comes with these new techniques. Dasborough et al. (2015) argue that a staff member, young or old, may be able to embrace change based on the belief that the new technology will be able to develop a new skill. If librarians believe they can be key players within a team, or simply believe that the new technology will be better than the old one, they may be able to embrace change (Pugh, 2016).

It has been established that change and technology are synonymous in the library and information services sector. Therefore, the following discussion expands on technological changes to which librarians, especially in the academic sphere, may be bound to adapt. Pinto and Little (2014) claim that librarians should consider new technologies, not only in terms of how they can benefit existing services or support users in the long term, but in terms of how they can also benefit their professional development and growth in the short term. Rendón (2015) believes that, despite all the dire predictions for the future of academic libraries in the digital age which anticipate that the digitalisation of print and other emerging technologies will make them irrelevant, universities around the world are evolving. Academic libraries are perceived as intellectual centres and catalysts for discovery, learning, collaboration, and scholarly breakthroughs. Cervone (2010) argues that perhaps one of the most essential actions librarians need to embark on, in order to foster innovation within their library, is to look outside the walls of the library. Applying the lessons learned from the commercial sector to the library may be wise because the expectations of library users are being set in the commercial sector, not in libraries. Facebook, Twitter, and smartphone apps are driving the wants and needs of patrons, not

library OPACs (Online Public Access Catalogues) which are online bibliographies of library collections that are available to users (Saksena, 2010).

Technology has changed the expectations of library patrons; people today expect to be able to find and access information from wherever they are. According to Jantz (2012), many library systems across America have increased both desktop and mobile technology for use inside the library, as well as access to e-books, audio books, research databases and archives. In a study done in Taiwan, 12 percent of academic libraries have, in circulation, pre-loaded e-reading devices that patrons can check out. Another 26 percent of academic libraries are considering adding this service (Chang, 2013). Academic libraries in Europe are employing technology in ways almost never envisioned before, for example, Global Positioning System (GPS) apps that help locate material inside the library, mobile apps that allow patrons to access library services, access to 3-D printers, binding services and book delivery robots (Rendón, 2015). Academic libraries in South Africa may need to follow suit or investigate whether or not their technology is on par with their European counterparts.

Aharony (2012) claims a survey done between librarians and students on the use of mobile technology showed that four out of five students use mobile phones more than librarians do. The researcher concluded that students were younger than librarians; thus these findings are not surprising. They echo other research that found that age is one of the most important variables influencing IT acceptance, and that older workers are less prone to adapt to new technology (Pinto & Little, 2014). Perhaps librarians today should readjust to current technology and gear themselves, as the nature of their job demands that they be technologically well informed.

2.10 Academic library services and UKZN

South Africa is richly endowed with academic libraries which are located in the country's 23 universities. In a study done by Raju in 2014, she states that many higher education libraries in South Africa offer state-of-the art LIS services to academic and research communities, hence the universities in the country are leading institutions on the African

continent. Thus, the analysis of knowledge and skills requirements for the digital-era academic library environment in South Africa is important (Raju, 2014).

Van Deventer and Pienaar (2015) found that in South Africa, researchers were involved in many disconnected, small projects to enable their participation in collaborative, global research projects. They also note that much funding is being used ineffectively, and that this poses a threat to sustainability because too many of these initiatives are isolated. Van Deventer and Pienaar (2015) further assert that valuable data and information are being transferred to international initiatives with very little regard to the intellectual property rights that were being developed. They suggest that a South African team approach, involving high-level participation and commitment to the interests of all researchers, would be considerably more beneficial to the country as a whole. Much has been done in developed countries outside Africa regarding implementation of technology in academic libraries, nevertheless many African countries are still struggling to implement Information and Communication Technologies (ICTs) (Haliso, 2011).

In Africa, South Africa is at the forefront in the implementation of both ICTs in libraries and mobile technology, notably the University of Johannesburg (UJ) and the University of South Africa (UNISA) (Haliso, 2011). Library information services such as searching the library website, managing patron records, requesting learning materials and searching certain databases are some of the services offered by academic libraries in South Africa (Mbambo-Thata, 2010).

2.11 Change management and Libraries

Cameron and Green (2015) define organisational change as any alterations of activities in an enterprise or institution. Change management is key in organisations because people require support in responding to changes that they face in the workplace (Du Plessis & Mabunda, 2016). Molaudi and Du Toit (2010) argue that information services are compelled to change, posing a challenging factor to managers who have to ensure that the challenges are properly dealt with. In practice, the alteration of activities can involve virtually any aspect of the organisation, including technological developments, restructuring, compiling and executing work schedules, all of which affect employees

(Cameron & Green, 2015). Vassilakaki (2014) maintains that, as a means for society, information services have always been influenced by changes in their environments. For organisations, their primary goal is progress which assumes change; while not all change is progress, all progress requires change (Pugh, 2016). Libraries have experienced some serious unplanned changes in the recent past.

Cameron and Green (2015) further state that change management is a systematic approach to dealing with change, both from the perspective of an organisation and from the individual. Change studied at the organisational level involves cognitive and planned contrivances to effect pre-emptive initiatives that create new thinking (Campbell, 2014). A constant factor in today's increasingly global information services sector is change. New technologies bring about innovations and new user bases emerge; therefore, the current collaboration between the two might bring about good change.

Immediate change in management is important because change in management thinking creates new values within an organisation (Jantz, 2012). For UKZN Libraries' personnel to accept change being brought by collaboration, management first needs to understand and anticipate changes arising in the division. Molaudi and Du Toit (2010) agree that most, if not all, information services inevitably face the need for change. Change could reflect as a result of the impact of environmental circumstances which may range from technological, political, economic and educational factors, as well as sociological factors and international influences (Pugh, 2016). The fundamental aspect of a successful change process is the management thereof and the recognition of the need for top management to be committed to the process of change (Du Plessis & Mabunda, 2016).

Librarians recognise that rapid change is a way of life in libraries and information services today. Further, it is no longer library management who must be able to manage change well, but all librarians (Gallacher, 2000). Although change is a difficult accomplishment to attain, it is a challenge that information services have to face because the aim in the implementation of change is to improve performance of the information services. Pugh (2007) states that change in information services has become a norm. The nature of change in library and information services has advanced within the Web which, to

reiterate, has resulted in the emergence of what is referred to as Web 2.0 and, more recently in the library context, Library 2.0. It is this development which has added a new dimension to library services, characterised by user contribution and interaction (Jantz, 2012). The literature shows that the involvement of technology in libraries has made a huge difference to the services provided, therefore the initiative to improve and move with the current trends is thus unavoidable.

2.12. Leadership and change in academic libraries

According to Cawthorne (2010), effective leaders who manage complex organisations often rely on the skills and abilities of subordinates at all levels in making and carrying out decisions. By encouraging the involvement of subordinates in decision making, senior or top leaders practise shared leadership. Such leadership is defined as the dynamic, interactive influence process involving more than just the downward influence on subordinates (Day, 2014). According to Duren (2013), change in libraries requires planning and organising as well as certain leadership competences. Lewin (1947) states that the first step of change involves preparing the organisation to accept that change is necessary, which he calls the “unfreeze stage”. The second step is change where people begin to resolve their uncertainty and look for new ways to do things. The last step is to “refreeze”, which is when changes are taking shape and people have embraced the new ways of working.

Once top management has recognised the need to change something in their library, it needs to be announced, especially the reason for the change. Smith (2011) argues that the change process may be delayed if there are no regular and constant discussions about the purpose as well as the benefits of change. Riggs (2011) states that academic libraries were fairly slow in changing the ways they did business in the past decades. The same could be said, in general, about institutions of higher education. These institutions are still perceived by many to behave and operate in an outdated manner. Academic libraries have generally been designed chiefly as a place to collect, access and preserve print collections; to enter and use them was considered a privilege (Dale et al., 2011). Despite their handsome exteriors the interior spaces were often dim and confining. The

buildings were difficult to navigate and specialised services and collections were inaccessible to all but the serious scholar.

Academic libraries, more than other types, have recently engaged in major restructuring. Some have eliminated long-standing positions (for example, Assistant Directors); some have gone almost entirely to a team-based structure and some have even reorganized themselves beyond recognition when compared with their former construct (Lakos, 2010). Why are libraries restructuring? There are several reasons. They include reducing bureaucratic constraints, being more responsive to their users, having more freedom and agility to act immediately on timely issues, and realizing a new work culture and environment (Matthews & Walton, 2012).

Scholars have suggested, either implicitly or explicitly that the research library and librarians must change. Martell (2012:10) stated “to create a range of services is unthinkable in the twentieth century, but mandatory in the twenty-first century, if we are to provide society with the value-added services it will need from its professionals.” In his article about the 21st century library, Atkinson (2001:8) stated “the new library must be mainly a social gathering place, somewhat noisy, with plenty of coffee.” These quotes suggests some rather profound changes were likely to occur in academic libraries. The libraries of colleges and universities are changing faster than their respective parent institutions. Essentially, everything in and around the library is changing: services, technologies, organisational constructs, ownership and access policies, values, and more (Chiwari & Mathe, 2015).

2.13. Collaboration as a means for advancing technologically

Literature has shown a wide range of benefits that can be gained through collaboration, such as innovation, cost savings and efficiency. Huxham (1993) states that collaborative advantage is concerned with creating interaction between collaborating organisations. This is done when each organisation, through collaboration, is able to achieve its own objectives better than it could alone (Gnyawali & Park, 2011). The collaborative process requires more time and communication effort than a single-institution approach. In a study done by Gnyawali and Park (2011) it reveals that collaboration is challenging yet quite

helpful for organisations to address major technological difficulties, to create benefits for partnering organisations, and to advance technological innovation. There are also transformation issues and strategic plans for reaching a shared understanding. Commitment across the two organisations for specific project outcomes, requires time (Irvine, 2010). Although a collaborative initiative seems to be time consuming, there can be more gains than disadvantages.

Anglada (2007) states that because the push for new approaches is also coming from changes in society and expectations, collaboration is a necessity now more than ever before. Erakovich and Anderson (2013) argue that negotiations need to take place before any resources are shared amongst collaborating institutions. Conversations need to happen on best ways to access to e-resources, how to deal with print and management for e-resources, which must be tested and proved (Erakovich & Anderson, 2013). Another aspect of collaboration is that within institutions themselves, collaboration between librarians and academics is essential in enhancing the academic success of students and the research capacity of the institution (Pham & Tanner, 2014). Collaboration within an institution entails a range of activities such as developing library resources, facilitating access and discovery of information sources, as well as embedding information literacy skills and research skills into the tertiary curriculum.

Collaboration has been one of the key ingredients of many successful stories, or failures due to the lack of it. Gnyawali and Park (2011) agree that collaboration provides timely access to knowledge and resources that are otherwise unavailable, and institutions can combine each other's resources in pursuing innovative projects that involve high risks and require heavy investments. Erakovich and Anderson (2013) point out that if we look beyond the library sector, there are many successful cases that demonstrate why it is crucial to collaborate and the values that can thus be created.

Gnyawali and Park (2011) mention the Apple Company as an example of successful collaboration and as one of the world's most valuable and profitable brands in the 21st century. Apple was on the verge of bankruptcy just 16 years ago, and the Chief Executive Officer of Apple said in an interview that collaboration was essential for innovation and its

way back to success (Cook, 2015). Pham and Tanner (2014) maintain that Universities as autonomous institutions have been operating independently and have looked internally for solutions for a long time. The authors further state that when libraries expanded their operations and developed their collections, bigger and better buildings were built in order to accommodate people as well as collections; but in this day and age libraries need to think of collaboration as a solution to many of their challenges (Pham & Tanner, 2014).

2.14. Conclusion

The chapter discussed the involvement of technology in academic libraries and how it has changed the way librarians deliver information to the users. This seems to be inevitable since most users have become more technologically astute and expect their libraries to move with them at the same pace in terms of innovation and technology. Therefore, academic libraries must take their mandate of delivering a relevant, timely and efficient service seriously in order to remain relevant. The next chapter focuses on the methodology and design underpinning the research process, which includes the study location, an outline of the participants, the data collection method, how the data were analysed and the reliability and validity of the study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

Research is largely based on theoretical expectations of what constitutes valid research and the methodology employed for a given study. Collis and Hussey (2014: 59) explain: "A research design is the road map that you decide to follow during [your] research journey to find answers to your research questions as validly, objectively, accurately and economically as possible". The strategy employed by researchers will depend on their research questions and the objectives of their research. This research will be based on the qualitative research approach. A study is classified as qualitative if the purpose of the study is primarily to describe a situation, phenomenon, problem or event; if the information is gathered through the use of variables measured on nominal or ordinal scales (qualitative measurement scales); and if the analysis is done to establish the variation in the situation, phenomenon or problem without quantifying it (Kumar, 2014).

The previous chapter provided a theoretical framework on change management and the different views adopted by studies on the subject of technological advancements. This chapter focuses on the methodology and design underpinning the research process, which includes the setting of the study, the outline of the participants, the data collection method, how the data was analysed and the reliability and validity of the study. The explanation for the research design, and the philosophical assumptions that provided an outline for the methodology used, is developed.

3.2. Study setting

This is an exploratory study aimed at generating in-depth knowledge and understanding of individuals' perception of technology advancements within the UKZN libraries as well as embracing new trends in the library sector. The study participants were executive managers (library management), senior managers (line managers) as well as middle management (subject librarians). The study was conducted within the institution. Sixteen respondents were interviewed, and all the participants were full-time employees of the university. The study setting was in a neutral environment, where respondents were

comfortable and the researcher's interference with flow of work processes was minimal (Sekaran & Bougie, 2013).

3.3. Research paradigms, methodology and design

Research regularly begins with a social request for information that needs to address a research problem. The choice of a strategy depends on the nature of the research being undertaken. Du Plooy-Cilliers, Davis and Bezuidenhout (2014) define a research paradigm as a set of fundamental assumptions and beliefs as to how the world is perceived, which then serves as a thinking framework that guides the behaviour of the researcher.

Collis and Hussey (2014) define a paradigm as the established research traditions in a particular discipline or philosophical framework. It is best described as a whole system of thinking. Furthermore, Babbie (2010) and Creswell (2013) agree that a paradigm includes the accepted theories, traditions, approaches, models, frame of reference, body of research and methodologies; it can be seen as a model or framework for observation and understanding. A paradigm is therefore a set of basic beliefs that guides actions. There are various research paradigms but the two distinguishing characteristics that form the core on which they differ, are the ontological assumptions and epistemological assumptions. Ontology is concerned with the nature of social reality and delves into what kinds of things exist, under what conditions they exist and how they are related (Babbie, 2010).

Epistemology is concerned with the method of knowledge and seeks to understand how human beings gain knowledge of the world around them (Babbie, 2010). These two aspects are a person's worldview, which has a significant influence on what they perceive as relatively important in reality. The different ways of seeing the world by different individuals has repercussions for research and academia as they influence the way we think about the world we live in and the world we want to live in (Rubin & Babbie, 2012). According to Du Plooy-Cilliers et al. (2014), qualitative research refers to the whole world experience and qualitative researchers want to seek the depth of the human experience associated with a particular phenomenon. Understanding these concepts is relevant to

this study as it requires investigation to delve into the perceptions of managers on embracing changes in technology, to identify the way managers understand, view and become aware of technological advancements through their experiences or implementation of new technological devices, that bring about change in the library environment.

Kumar (2014:9) states that “[r]esearch is a structured inquiry that utilises acceptable scientific methodology to solve problems and create new knowledge that is generally applicable”. The author continues by defining research as a systematic investigation to find answers to a problem. There is a mode of enquiry which has three approaches: quantitative, qualitative and a mixed-methods approach. A basic distinction between quantitative and qualitative research is the way the data are collected, analysed and presented. The mixed-methods approach uses the strengths of both qualitative and quantitative research (Du Plooy-Cilliers et al., 2014).

3.4. Quantitative research

Quantitative research uses a deductive approach, where the researcher strives for reliability of the data (Henning, Van Rensburg, & Smit, 2013), which means that the same findings can be replicated for other sample population groups. This method typically involves questionnaires that are distributed to participants to complete. Participants’ input in data using this method is often limited, however, as there are no opportunities for probing questions and for the researcher to prompt further questions (Henning, Van Rensburg, & Smit, 2013). Researchers using this method often strive for reliability and will ensure that their findings can be replicated. The quantitative research method is more useful when the researcher wants to express findings or is looking for causal explanation by using statistics, such as correlations, frequencies, and means (Bryman, 2015). Table 3.1 (below) presents the advantages and disadvantages of quantitative research.

Table 3.1: Quantitative Research Advantages and Disadvantages

Advantages	Disadvantages
Quantitative research allows the research and description of social structures and processes that are not directly observable	Quantitative research compresses and simplifies complex issues
Quantitative research is very useful for obtaining data that allows quantitative predictions to be made	The researcher may miss a phenomenon occurring because the focus may be on getting the theory or hypothesis
Quantitative research findings can be generalised when they have been replicated on many different populations and subpopulations	It is only applicable to quantifiable and measurable phenomena
Data collection in quantitative research is quick and easy (telephone interviews, surveys are a few examples).	Analysing large data can be very expensive as computer software is required.
Analysis and explanation of (causal) dependencies between social phenomena.	Time consuming to design questionnaires, testing and validity

Source: Adapted from Hoque (2014:13)

3.5. Mixed approaches

A mixed approach involves a combination of qualitative and quantitative methods. Supporters of this method argue that it provides a more complete understanding of a phenomenon (Henning et al., 2013). The rationale underpinning the mixed-methods approach is firstly the belief that you cannot always get accurate answers to your research questions, and secondly that more than one method will provide a better picture of the research problem (Henning et al., 2013). However, there are some shortcomings of using mixed-methods research. For one, it requires additional time due to the need to collect and analyse two different types of data (Creswell & Plano Clark, 2011). Additionally, the

research requires knowledge of both quantitative and qualitative methodology, and many researchers do not have expertise in both methods.

In a study done in 2006 to ascertain the added value of applying a mixed approach in a study, the authors found that a mixed-methods approach can make a researcher gain a deeper, broader understanding of the phenomenon, as opposed to using either the purely quantitative or the purely qualitative approach (Hurmerinta-Peltomäki & Nummela, 2006). Moreover, it was found that mixed methods added credibility to the study by increasing validity in the findings, edifying the collection of the second data source, and therefore adding to the overall body of knowledge (McKim, 2017).

3.6. Qualitative research

Sekaran and Bougie (2013) explain that qualitative research has different assumptions and approaches to quantitative research. There is an emphasis on seeing the world from the eyes of the participants; the attempt is to make sense of the phenomena in terms of the meanings people bring to them. The qualitative research terminology encompasses several research approaches that are different, although with two common components (Leedy & Ormrod, 2010). One is the focus on phenomena that are in natural settings (real world). The second one involves capturing and studying the complexities of an identified phenomenon (Conyers Jr, 2016). Henning (2013) also posits that qualitative research is very powerful as it can uncover details that give the researcher a deeper understanding of the problem and the participants.

Qualitative approach follows a flexible, unstructured approach that places emphasis on feelings, experiences and perceptions. This approach entails the use of unstructured interviews or observations as a means of collecting data (Kumar, 2014). It also affords the researcher an opportunity to adjust the research design; thus the design itself develops as the process unfolds. Essentially this means that the breadth of the study can be adjusted according to what the researcher deems important. Qualitative research requires careful thought from the onset, as it needs mental agility, flexibility and alertness during data collection, data analysis and write-up (Davies & Hughes, 2014). Hoque (2014) details the advantages and disadvantages of qualitative research.

Table 3.2: Qualitative Research Advantages and Disadvantages

Advantages	Disadvantages
Qualitative research can be done in a short space, in-depth information can be gathered and it is cheaper.	Analysis takes time due to having to solicit information and securing interviews can be a struggle.
It gives the researcher the opportunity to be involved and interrogate issues.	In some instances, deviation from the topic may happen.
Qualitative research offers flexibility.	The research findings are not generalisable.
In-depth information can be gained through interviews.	Interviews can make soliciting sensitive information more difficult.

Source: Adapted from Hoque (2014:13)

In this study, a qualitative research method was adopted as it provides a theoretical insight that outlines the type of problem being investigated and informs the methods for data collection. The intention was to bring about clarity concerning changes in technology and to solicit opinions of management and staff regarding the matter. Qualitative research aims for in-depth understanding where the variables are not controlled, and the use of qualitative methods are generally characterised as being interpretive and subjective (Creswell, 2013a). This qualitative research aimed to elicit the intangible factors associated with the problem, such as the opinions of senior management on the implementation of the technological system and devices, so as to be relevant. An interview schedule was the primary instrument of data collection and analysis.

3.7. Sampling

A selection of respondents, that is, a selection of only a few items representing the total population to be studied, constitutes what is technically called a sample and the selection process is called the sampling technique (Kothari & Garg, 2016). Du Plooy-Cilliers et al. (2014) further posit that a sample is a subgroup of a population that is representative of

that population. There are two sampling methods - probability and non-probability sampling. A probability sampling method refers to when each unit of a sample population has an equal opportunity of being drawn. This is a common methodology used in quantitative analysis. The different designs under this type of sampling are simple random sampling, systematic sampling, stratified sampling and multi-stage cluster sampling (Du Plooy-Cilliers et al., 2014). Non-probability sampling methods are used when elements in the population cannot be individually identified or when these elements are unknown. There are six non-random sampling designs: quota sampling, accidental sampling, convenience sampling, purposive sampling, expert sampling and snowball sampling (Sekaran & Bougie, 2013). The main aim of purposive sampling is to assess who can provide the best information to provide answers to the problem statement or objective of the study. Only people who have the required information and are willing to share it are approached (Creswell, 2013a).

In this study, it was crucial to purposively choose participants who would contribute to the enrichment of the research and provide information that could be meaningful. The participants had experience in engaging with different technological devices within UKZN Libraries, thus they are in a good position to contribute their perspectives on reality, in terms of a deep understanding, and offer a detailed perspective of the problem statement. Top managers (library management), senior managers (line managers) as well as middle management (subject librarians) were selected to participate in the study from the Westville, Howard, Edgewood and Pietermaritzburg campuses. The participants were of different age groups, races and gender. A purposive method of sampling was employed for this study. This method of sampling allows a selection of participants who possess the knowledge and experience required to support the research objectives of the study (Davies & Hughes, 2014). Purposive sampling is a form of the non-probability sampling method, where the items for the sample are carefully chosen by the researcher and the choice concerning the items remains absolute (Kothari & Garg, 2016). The following information illustrates a sampling technique that practically shows how respondents were purposively chosen to be included in this particular study (see Table 3.3). Participants were chosen according to years of experience in engaging with changes in technology, of which the minimum was seven years.

Table 3.3: List of Respondents

Respondents	Organisational Level	Grade Level	Gender	Age	Length of service	Line of work
R1	Top management	5	Female	47	15	Director
R2	Top management	6	Female	53	29	Head of Client Services
R3	Top management	6	Male	55	30	Head of Core Services
R4	Top management	6	Female	45	12	Head of Information Services
R5	Senior management	7	Female	39	10	Principal Librarian
R6	Senior management	7	Male	48	25	Principal Librarian
R7	Senior management	7	Male	46	12	Principal Library IT
R8	Senior management	7	Female	40	15	Principal Librarian
R9	Senior Management	7	Female	39	10	Principal Librarian
R10	Senior management	7	Female	51	27	Senior Librarian
R11	Senior management	7	Male	42	21	Head of Circulation
R12	Middle management	8	Female	48	25	Senior Librarian
R13	Middle management	8	Female	43	22	Senior Librarian
R14	Middle management	8	Female	38	7	Senior Library IT
R15	Middle management	8	Male	41	20	Senior Librarian
R16	Middle management	8	Female	47	23	Senior Librarian

Source: Compiled by the researcher

3.8. Data collection strategy

Data collection is the process of gathering information for a particular research study or project (Creswell, 2013a). The study used primary and secondary data in its qualitative data collection. Qualitative research uses an array of methods that are interactive and which involve active participation by participants. Sensitivity toward participants is of paramount importance to the study. Researchers look for involvement of their participants in data collection and seek to build rapport and trustworthiness with the individuals in the study.

3.8.1. Primary data sources

There are various methods of sourcing data, such as interviews, observations, eye-witness accounts or any other research conducted for answering the objectives of the study (Du Plooy-Cilliers et al., 2014). The primary source of data collection for this study is interviews. There are various types of interviews, such as:

Focus group interviews – In focus group interviews, the interviewer attempts to explore the experiences, perceptions and understandings of the group, who may share a common experience with the situation or study in question. The main advantages are that they are useful for obtaining detailed information about personal and group feelings, perceptions and opinions. They can save time and money compared to individual interviews. This type of interview differs from other interviews where broad topics are prepared beforehand, to serve as a framework for wide-ranging discussions (Kumar, 2014).

Unstructured interviews – Rubin and Babbie (2012) describe an interview as a social interaction between two individuals. The decision to interview is based on the kind of research question that the researcher needs answered. According to the authors, unstructured interviews have the advantage in that content, structure, questions, wording and order have complete freedom and flexibility. Unstructured interviews bring to the attention of the researcher what individuals think, feel and do (Rubin & Babbie, 2012).

Structured interviews – This process involves a pre-determined set of questions between the interviewer and the participant which in most cases are closed questions

that require a precise answer (Creswell, 2013a). The interview is standardised and the same questions are asked of all participants. This type of questioning is used when the goal or objective of the study is clearly understood and specific questions are asked for a targeted response (Babbie, 2010).

Semi-structured interviews – This method includes features of both structured and unstructured interviews and will have a combination of both open-ended and closed-ended questions. In this type of interview, the interviewer has a set of pre-planned questions to ensure consistency; however, as the interview progresses, the interviewee has the opportunity to provide more information if a respondent wishes to do so (Henning et al., 2013). This particular study followed semi-structured, in-depth interviews and the interviews were carried out in person.

3.8.2 Interviews in data collection of the study

The interviews in the study had the flexibility in adapting, adopting and changing the questions as the researcher proceeded (Sekaran & Bugie, 2014). Pre-testing for the purpose of identifying such problems, as well as to ascertain the approximate timing of interviews, was conducted on two managers, who gave an insight into the type of data that would be obtained.

The interviews took the form of face-to-face interactions between the researcher and the participants; the dates of interviews varied and were done according to each respondent's availability. The interviews were semi-structured and took place at the respondents' offices; they were free from rigid boundaries and allowed the interviewer the flexibility to deviate from a pre-determined course of questions (Appendix 2). This approach allowed the researcher the spontaneity to ask probing questions that provided greater insight into the responses provided.

The interviews were scheduled with participants at their convenience and were concluded within 45 minutes. Prior to the interview a covering letter was sent to the participants, where the researcher introduced herself, explained the objectives and relevance of the study, and provided contact numbers if participants wanted to query anything relating to the study. Sekaran and Bougie (2013) argue that open-ended questions seek a wealth of

in-depth information, provided that participants feel comfortable. In this study the participants were enthusiastic about taking part and felt free to contribute and express their opinions and experiences, which allowed for the expression of a greater variety of information. The participants did not express any objections to the recording of the interviews.

The study explored how far UKZN Libraries are in terms of technological advancements, and what changes are required to make UKZN Libraries more competitive, user-friendly and useful to its end-user. It thus required an in-depth understanding of each participant's view on the subject.

3.8.3 Secondary data sources

Secondary sources of data refers to data that was collected by someone other than the user, common sources of secondary data for social sciences include censuses, information collected by government departments, organisational records and data that was originally collected for other research purposes (Du Plooy-Cilliers et al., 2014). The use of this type of data sources also poses some areas of concern that a researcher needs to bear in mind. These are the validity and reliability of information sources, such as personal bias due to some writers being less objective, the availability of data required to be used in the study, and the relevancy of the format of the available information (Kumar, 2014). For the purposes of this research, a variety of journals were studied, UKZN library reports as well as minutes from certain library meetings. The secondary data sources were sourced for providing past and present perspectives on the study topic in question. Journal articles are written by experts in a particular field of study and offer credibility to research, as they are peer-reviewed. They may offer a historical perspective or a broader perspective of the study in question (Jackson & Verberg, 2007).

3.9 Data analysis

Data analysis is the transformation of raw data into meaningful information that provides answers to the objectives of the research. According to Du Plooy-Cilliers et al. (2014), qualitative research has some distinctive characteristics, which are described here.

It is textual, which includes using oral, written or graphic language. In the analysis of this text, the researcher conducts an in-depth reading of the text. The process is iterative or cyclical, which means that the researcher is constantly analysing and interpreting data in an attempt to gain new meaning and greater insight. Creswell (2013a) explains qualitative research as hermeneutic, which is interpretation theory, and it entails a detailed reading or examination of a text which could refer to a conversation, written words or pictures. It is subjective because it is the researcher's description of the data. It therefore becomes a more laborious task for researchers as they have to motivate or substantiate the outcomes. Data collection and interpretation are construed as symbolic. Collis and Hussey (2014) stated that qualitative analysis requires good organisational and interpretive skills. There is an overwhelming amount of data that has to be systematically sifted through so that the researcher can establish its relevance and importance to the field of study.

This type of analysis was seen as relevant, so the researcher examined data in order to gain a clear and logical understanding of the respondents' thoughts and to transfer their experience into the study. Most qualitative studies advocate thematic analysis as one of the best methods to use, as it allows the researcher to get close to the data and investigate broader patterns (Kothari & Garg, 2016). In conducting thematic analysis, the researcher applied the six steps as described by Creswell (2013b), which are:

- **Familiarising or getting to know the data** – For the purpose of this study the recorded interviews were transcribed verbatim. This allowed the researcher an opportunity to familiarise herself with the data and to gain a better understanding of the information gathered. The process of listening to the recordings and then transcribing them constituted an iterative process which allowed the researcher to gain a deep understanding of the thought processes and views of the participants (Henning et al., 2013). During the transcription process, the researcher was afforded an opportunity to rewind, re-listen and re-write each transcribed datum in a format that allowed the researcher to view all responses from the respondents against each question.

- **Collating of relevant data through coding** – Data that appeared relevant and interesting to the researcher was identified and labelled. Once all the recordings were transcribed the process of thematic coding began. Thematic coding, which is also referred to as conceptual coding, was used to reduce the data and identify themes (Maruyama & Ryan, 2014). The thematic coding involved a process of scrutinising the transcribed material by reading and re-reading it to ascertain the common ideas or themes that were being expressed. Repeated or similar information was labelled. In some cases, the responses were suggestions or recommendations.
- **Exploration for themes emanating from the initial codes** – Following the guidelines outlined immediately above, the initial codes collated from all data were categorised into phrases using visual presentations to map out the themes. These phrases were combined so that common themes or patterns were identified and categorised. The categorisation helped the researcher make comparisons and contrasts between the emergent patterns and complex threads of data that were inter-related.
- **Review of themes** – During this step the entire data was scrutinised with an aim to discover underlying patterns and bring several codes together. Themes were refined in terms of their relevance. Themes that were found lacking in terms of relevance were discarded, whilst other themes were broken down further to provide more meaning.
- **Definition and naming of themes** – Further analysis of themes in terms of how they connected to each other and how they fitted into the research question was undertaken. According to Creswell (2013b), this process culminates in the main results of the study where the new knowledge from the perspective of the participants is presented. In cases where complexity from the themes emerged, sub-themes were identified as indicated in Table 1.4 in chapter four. Support of the themes and sub-themes was presented by the inclusion of direct quotations from respondents, also presented in the next chapter.
- **Writing of the report** – A presentation of findings in terms of the inter-connectedness of themes, the interpretation of results based on results from similar studies, theories and other relevant concepts is presented in a report discussed in Chapter Five; whilst

the write up of conclusions drawn and recommendations from the study forms the basis of Chapter Six of this study.

3.10 Research evaluation

In qualitative analysis, the research undertaken is directed at understanding the meaning and the interpretation of a phenomenon. The aim of qualitative research is to ensure that there are no broad generalisations; to achieve this end, the concept of trustworthiness is used to measure reliability and validity (Neuman, 2011). There are several different strategies to support the trustworthiness of qualitative-research findings. These are credibility, transferability, dependability and confirmability (Du Plooy-Cilliers et al., 2014).

Credibility refers to the extent to which data is believable and trustworthy. Creswell (2013a) states that credibility is establishing whether the research is believable from the perspective of the participant in the research. He further emphasises that the respondents are in the best position to judge whether their opinions and feelings are accurately reflected. If the respondents are in agreement with the findings, then the level of validity of the study is high (Neuman, 2011). The researcher distributed the findings via e-mail to all the participants who were interviewed and requested feedback from each of them. This gave the researcher an indication of the true reflection of whether the data was analysed accurately.

Transferability refers to the degree to which the results can be generalised or transferred to other contextual settings (Kumar, 2014). Transferability is a major challenge in qualitative research, due to subjectivity of the researcher being the key instrument. Transferability can be achieved if a researcher thoroughly describes the settings of the study and explains the process followed in detail. In Chapter One, this study provided a rich understanding of the environment the study was conducted in, and provided a detailed theoretical framework on the subject matter in Chapter Two.

Dependability is related to the concept of reliability and refers to the extent to which the research findings can be replicated with similar subjects under similar circumstances. To ensure reliability, all transcriptions were checked and where the researcher was unclear

on certain issues mentioned in the recordings, she contacted the relevant person for clarification. A rich description of the topic, environment and circumstances was provided for the study in Chapter One.

Confirmability is the extent or degree to which the results can be confirmed by others (Kumar, 2014). In order to achieve this, it is important for data that is collected to be organised and stored so that it can be easily retrieved. Confirmability is also a reflection of how well the findings are supported by the data that is collated (Plooy-Cilliers, 2014). In this study, the transcriptions and secondary data sources were verified, organised and stored, so that anyone wanting to access this information will be able to do so. Another important concept in qualitative research is triangulation of data, which refers to establishing the external validity of the data. This is done by comparing different types of data and different methods of data collection, to test whether they corroborate with one another (Maruyama & Ryan, 2014). Triangulation ensures that the accuracy of findings in qualitative research is increased. In this study the researcher did this by comparing and contrasting the findings with research obtained in journal articles that are peer-reviewed, and also with theory from literature.

3.11 Ethical consideration

Davies and Hughes (2014) stipulate that data collection techniques that are developed need to consider whether the research process is likely to cause any harm, either physically or emotionally. Such harm can be caused by violating an individual's right to privacy; unauthorised monitoring of participants' behaviour patterns; making personal information public or failing to respect the values, cultures or traditions of participants (Davies & Hughes, 2014). It is therefore unethical to interview participants without obtaining their consent and seeking their willingness to participate in the study. According to Collis and Hussey (2014), the research participant must be aware of the following:

- The purpose of the study, methods and intended use of the research findings;
- The confidentiality of information and anonymity of the respondents;
- Participation is voluntary and free from intimidation;

- The participants' interest and well-being will not be harmed or damaged;
- The impartiality of the researcher must be clear and any conflict of interest or partiality must be explicit.

Ethical consideration in this context refers to the principles of a code of conduct that governs the way research is conducted (Sekaran and Bougie, 2013). The researcher ensured that the Informed Consent letter (Appendix 1a) were signed by each participant and the process was also explained in terms of how the interviews were to be conducted. This included information about the recording of the interviews, the transcription of the data and issues surrounding confidentiality and anonymity. Kumar (2014) highlights the need for pre-testing with the aim of identifying if questions are worded correctly, are clear and are free of ambiguity.

The researcher submitted an application for ethical clearance which was approved by UKZN, the ethical letter (Appendix 3) was thus received as permission to conduct the study. Before commencing with data collection, the researcher sought permission from the UKZN Libraries Director. Approval for this study was duly granted and the signed internal research forms and a gatekeeper's letter were received. The Informed Consent form (Appendix 1b) was explained to the participants, detailing the research objectives and the research questions. Each participant in this study submitted a signed Informed Consent form prior to each interview being conducted. The researcher further protected the identity of the respondents by using codes (R1-R16) instead of real names during the analysis and presentation of the data.

3.12 Conclusion

This chapter has outlined the research paradigm, methodology, strategy and design used. A detailed explanation of the selection of participants, data collection methods, analysis and rationale beyond a particular choice was provided. This provides a framework for the analysis of the results which will be discussed in the next chapter. Chapter Four presents data that was obtained from the interviews using a process of thematic analysis. Data is presented in a format that is meaningful and allows the researcher to gain a deep understanding of the information.

CHAPTER FOUR: PRESENTATION OF RESULTS

4.1. Introduction

The three previous chapters gave an overview of the study in terms of its purpose, the relevant literature and the methodology employed to collect data in order to investigate the impact of technological changes and the extent to which the changes are embraced at UKZN Libraries. This chapter aims to present an analysis of the data collected, including the discussions and results from the interactions with the respondents. As mentioned in the previous chapter, the process of thematic analysis was applied in this study. Thematic analysis in qualitative research involves identifying, examining, and recording themes within data. This process facilitated categorising the data collected.

Semi-structured interviews were conducted with UKZN Libraries' staff, from lower management to executive management. The interviews were done in order to obtain data from sixteen respondents. This approach allowed the researcher the spontaneity to ask probing questions that provided greater insight into the responses provided, as opposed to administering of questionnaires, where results have to be quantifiable and measurable. Some of the themes that emerged were staff training, good customer service, and current technology adaptation.

This chapter discusses the findings of the study. The findings indicate the need for innovation, and resistance to change was identified, all contributing to embracing changes in technology at UKZN Libraries.

4.2. Detailed analysis

Thematic analysis was used in this study. Interviews were transcribed verbatim, which allowed for themes to emerge as data was analysed. Sub-themes also materialised during the process of analysis. Table 4.1 summarises the themes and sub-themes:

Table 3.1: Summary of Themes and Sub-Themes

THEMES	SUB-THEMES
Technological changes	Adapting to new technologies
	Academic libraries and technology
	Mobile technology
	Going 'E' (electronic/online)
Embracing changes in technology	Change advantages
	Challenges of change
	Resistance to change
Training and development	Upskilling
	Personal development
User friendliness	Service quality
	Disabled facilities
	Online resources
Competitiveness	On par: technological developments
	Security issues
	Social media: going where users are
	Knowing your parameters
Leadership challenges	Dealing with staff: introducing change
	Funding issues - budget cuts, sourcing funds externally
	Ways to inspire staff
Technologies users appreciate	Knowing users' needs
	Importance of innovation
	Staying relevant
Strategy	Technology strategies
	Strategies to facilitate change
	Current projects

Source: Compiled by Researcher

4.2.1. Technological changes

4.2.1.1 Adapting to new technologies

Respondents were of the opinion that UKZN Libraries are already adapting to technological advancements. This is through a number of initiatives that have already

been put in place such as the move from the Symphony Library platform to the WorldShare Management System (WMS), which is a new library system. They regarded the WMS platform as a very technologically-advanced move, where academics and students of the institution can use this as a one stop shop for harvesting different types of information sources all at once. Although a large number of respondents agreed that UKZN Libraries is 'on par' with the rest of the world, some beg to differ.

"I think UKZN Libraries is at the forefront of adapting and embracing the ever changing latest and new technologies". (R16)

Another respondent stated that:

"The new system WMS is quite a user-friendly system it can aggregate different databases into one search facility". (R5)

Some respondents mentioned they do not think UKZN Libraries is at the forefront in technological advancements. They believe the library needs a lot of improvement in terms of delivering its services more efficiently. One respondent mentioned that relevant technologies are needed so as to adapt to current trends in the library sector.

"To adapt to technological changes, we need to first implement the current trends within the library sector". (R8)

One participant reflected on the current services and further highlighted how important it is to adapt to current technological advancements. The participant mentioned:

"Technology is essential to the library world, we have distance students they need multiple access points to information and has to be easily retrievable from anywhere the user is". (R6)

4.2.1.2 Academic libraries and technology

There was a general understanding amongst respondents that technology and academic libraries go hand in hand; one cannot exist without the other. Technology has changed the way people live and users today have several options of information sources. Technology in academic libraries has defied geographical barriers, even for the university

student, especially because users of academic libraries are often complaining about not having time for library visits. It is thus the duty of an academic library to address these “tech-savvy” library users' needs and align its services to satisfy them.

Respondents felt that technology was an important part of their job since it enabled them to offer a better service and be more proficient. Furthermore, it was mentioned that the technology offers users the option of accessing information remotely without having to step foot inside a library building.

“There are many services and applications that we offer that embrace technology. There are also a lot of new developments in technology”. (R14)

Respondents also indicated that the move towards an e-library will be beneficial to UKZN Libraries. They stated that they want to take full advantage of technology and use it to its maximum.

“Our students that we are supporting are into technology so if the library wants to stay relevant it has to move with its client”. (R9)

It has been found that academic libraries are focused on assisting students and senior researchers to understand the new processes for research; they also support their production of scholarly materials, requiring them to work with diverse technologies such as various hardware and software, as well as relevant information content.

One respondent mentioned:

“Libraries have evolved from traditional to digital hence information must therefore be accessible in technological format” (R12)

Another participant stated:

“Information has to be available online, and UKZN Libraries is making sure of this by digitising their print information” (R2)

It was established that although the participants could not define exactly why academic libraries and technology go hand in hand, their responses explained the importance and significance of technology in an academic library.

4.2.1.3 Mobile Technology

It was noted that there was an urgency pertaining to mobile technology within the library environment, as many respondents commented on the issue as part of new technologies. Its importance and the role it plays was greatly emphasised by respondents. Internet access from mobile devices has altered not only the way people communicate, but also has affected the way users search, retrieve and use information to address their daily needs. Respondents were questioned how UKZN Libraries can adapt to new technologies, and respondents mentioned that there should be a more vigorous approach to implementing mobile technology as a service, so as to cater for the type of users they cater for. One respondent stated:

“There are lot of new developments in technology, but it starts with the mindset of the individual”. (R14)

“The Smartphone is what being used right now...going with the mobile technology is one of the ways that UKZN can embrace technology”. (R3)

Other respondents mentioned:

“If you want to adapt to technological changes you have to expose yourself to those technological changes that are going on”. (R4)

“The fact is we’re having more students with these technological devices, now we need to adapt”. (R7)

The respondents all agreed there should more done regarding mobile technology so as to accommodate a large number of devices and enough network capability. Proper software applications and hardware devices were mentioned as one of the ways where students and academics can gain access to resources with ease. At the moment UKZN has other technologies that assist users, for example users are accessing the e-resources

from off campus via Ezproxy and although that is working well respondents reiterated that now the focus should be more on mobile technologies.

It has been found that librarians need to provide library websites which could be accessible easily via mobile devices, as their users are using mobile phones instead of laptops and desktops to search on the catalogue for information sources. One particular participant mentioned:

“We need to harvest and harness information using the mobile technology as a mechanism for retrieving information”. (R6)

4.2.1.4 Going ‘E’ (electronic/online)

There was a common understanding amongst management about going ‘e’. Respondents mentioned that the concept of going completely electronic as a library is currently in discussion and is underway. Even though no time frame was mentioned by the respondents, most agree that it is the best solution for effective service provision, especially for the calibre of users they serve. One respondent specified that we are serving a generation of digital natives rather than digital immigrants. Today’s students are no longer the people our educational system was designed to teach. The users of the library are all well versed in technological advancements. A respondent passionately stated:

“We are already on the path but the push towards becoming more competitive is to become an e-library”. (R1)

Another respondent mentioned:

“There is a team that is working in remodeling our user-education from print into video, it’s a clear indication that we want to move from print and we want to go ‘e’”. (R9)

Respondents believed that going completely electronic as a library will best serve and produce an efficient service to its users. One of the reasons why this move would be a logical venture was that respondents mentioned space as an issue. They stated that the number of students registered at UKZN is 45,683 and the library only has capacity for

about 4,500 students. Therefore, it is best to provide a service that will enable users to access library services remotely, so as to limit the number of walk-ins.

“We are trying our best to ensure that technology becomes the centre; reason being there is no space... so that people they do not necessary have to come to the library”. (R2)

“We want to go ‘e’. But because of finances that could hold us up”. (R3)

There has been a general decline in the physical usage of libraries worldwide, adding to the move toward the usage of technological devices to access library services, such as e-books. Furthermore, there has been an increasing tendency to read books on computers or mobile devices such as tablets or smart-phones among the younger generation. This adds to the notions highlighted by the respondents, mentioning that students today do not really need the “building space” but that they require the services online.

4.2.2. Embracing Changes in Technology

4.2.2.1 Change Advantages

Respondents concurred with the view that embracing the changes in technology has many benefits. It was mentioned that technology brings changes but it also makes life very easy and efficient for staff. Compared to the time when work was manually based, the respondents agree that there has been a lot of improvement in serving the users since technology came to play. Librarians have evolved to meet the changing needs of their users and by embracing technological advancements they are still relevant because of their knowledge, skill and passion. One respondent stated:

“The way we work at client services is very technology inclined, I mean technology streamlines things”. (R2)

The users of the library in our campuses can use our libraries online on their desktops, respondents stated. Technology comes with convenience, especially for users; and the changes that come with technological advancements can advance services to a different level. One respondent mentioned that UKZN Libraries can even introduce ‘makerspace’ as one of their services in their libraries. A makerspace is a collaborative work space

inside a school, library or separate public/private facility for making, learning, exploring and sharing, it uses high technological equipment and to none technology tools.

“We need to look at a makerspace in the library, a place where people can collaborate and use information and resources to become innovative”. (R12)

Another benefit is the interaction with users, which has become more ‘personalised’.

“It’s about personalising the service, you know the students could be sitting at work and interacting with library staff, this can be done to change the way we work so to utilize technology to its fullest”. (R11)

Another point the respondents agreed on is that technology has made it easy for librarians to interact and share their technological experiences. Respondents stressed the importance of collaboration and networking. They stated that in order to stay relevant and be cognisant of what is happening in the library sector, librarians need to communicate with their colleagues on regular basis. Participants also mentioned that if academic libraries work in their little corners and are isolated, they will not develop, as technology encourages collaboration and communication.

“Librarians need to understand what’s happening in their environment and ... technology has eradicated the asylum mentality”. (R4)

It was a common thought among respondents that technology provides a faster, better and efficient service. Respondents further mentioned that because UKZN Libraries serves users who are technologically inclined, technological changes has enhanced their service delivery.

“Technology enhances what we do, it now takes care of the things we were concentrating on before, like in client services students can now use ‘lib-chat’ (an online chat system) instead of coming to the desk to complain or if they have questions”. (R5)

Respondents also commented on the new library system, WMS. They mentioned that while it was difficult at first to accept the change they have welcomed the proficiency of

the system. Respondents further agreed, stating that we are ahead of other institutions in South Africa.

“The catalogue search box is prominent on the home page with simple navigations that do not overwhelm user”. (R12)

“I think UKZN Libraries is at the forefront of adapting and embracing the ever changing latest and new technologies such as having the state of the art library system WMS”. (R16)

Top management revealed that the new library system has brought about a lot of welcome changes technologically, plus as the ‘leader of the pack’, a few other institutions are following in our footsteps. One respondent in particular emphasised:

“If you look at the system that we’ve adopted, we’re the first one in Africa and we’ve been having other counterparts coming to learn from us, like the Stellenbosch people, UP came and they started adopting the technology that we have”. (R1)

4.2.2.2 Challenges of change

Some respondents mentioned that technology is forever rapidly changing and sometimes it can be overwhelming. Respondents further mentioned that the main challenge is keeping up with the trends in the library sector, as the nature of library and information services is synonymous to change as well as technology. Academic libraries are facing times of exceptional challenge and incomparable change. It was mentioned that when changes take place, most people are not ready for them and they fall somewhat behind while others move forward faster with the change.

“Some staff are stuck in the old ways of doing things, they don’t want to change, and they still believe the old way of doing things is the best”. (R14)

“We need to rethink how and where staff should be placed, as well as reskilling to be able to be ‘up there’ with others in terms of applying technologies more effectively. We lack skills and depth to the necessary staffing”. (R10)

Respondents also mentioned that most staff lack exposure to current technological developments, which contributes to some challenges when change is introduced. With the advent of the latest devices such as iPads and MacBooks, librarians fall behind in terms of knowing how to use them. Respondents mentioned that the challenge they face is when they have to assist the users of the library who come to them with these different types of devices. Respondents stated:

“Most staff have graduated from this institution and got a job here, they have not worked in other libraries and do not have exposure to what’s happening in other institutions”. (R6)

“Staff do try their best to embrace technology, but I think as a library we are lacking in exposing staff to some of the latest gadget available”. (R9)

Another respondent mentioned:

“Technology is developing at a rapid rate, there is a lot of new software, and hardware that’s out there that we need to be more familiar with”. (R15)

The respondents felt some of the challenges with changes in technology could be overcome if top management could introduce other equipment/devices, other than computers, to be used by staff. Especially because the library is client-centred, the users expect an excellent service; currently the library does not offer it due to difficulties in assisting users with new devices such as iPads and Apple Mac laptops. One respondent said:

“It’s so embarrassing sometimes when you see your colleagues unable to offer the service; you know they know what they are doing but the student will come with an iPad or a Mac laptop and they aren’t able to assist because they do not have exposure to these gadgets”. (R11)

4.2.2.3 Resistance to change

Respondents were asked if there were potential areas of resistance to change that staff might have. One respondent stated that this ‘thing’ of resistance to change is a little contradictory, because it is not that you don’t want to learn a new thing but that you are

not willing to let go of the old. Respondents felt some of the staff can be resistant to change due to the following:

Redundancy: respondents mentioned that there is a belief that technology will replace the human aspect of things, so that is why staff resist changes in technology.

“Our minds were on the old system and we wondered if this new system is going to do what we want it to do, but as we overcome our fears we appreciated its features”. (R9)

“Very often people think technology is going to replace. No, technology doesn’t replace, it enhances what we do”. (R2)

Confidence: Other respondents established that some staff have issues relating to lack of confidence. The respondents believed that if staff can eliminate fear, they can embrace the changes that come with technology. Some people lack confidence because they have not been exposed to the changes, yet others lack confidence because of self-imposed negligence. One responded stated:

“I think depending on some staff, maybe they don’t feel confident enough to actually use let’s say Facebook, or blogging because of the exposure and they feel resistant to that change”. (R7)

“Well I think basically when there’s resistance it’s where staff is not fully confident on their abilities”. (R16)

Another respondent said:

“There are people who were hired when a qualification was not needed and received fee remission to study, but they got comfortable and didn’t study or acquire any skills. Some of these people have become irrelevant. Education plays a major role, they don’t see the importance of embracing the change”. (R5)

Communication: According to some respondents, resistance to change may be caused by lack of communication. In some cases, respondents mentioned there might be communication from management to staff but staff may still resist change because there’s

no clear understanding of what is about to happen. This may lead to people assuming or interpreting the information according to their own understanding, as opposed to what was actually intended. Some of the respondents stated:

“Once you explain to staff about technological changes and how it will affect their work and how it will make their work better, at the same time providing a professional service and an enhanced service to our user; that can alleviate resistance”. (R6)

“It’s lack of understanding or not knowing actually what the main intention of the changes are, people need to be informed way in advance”. (R11)

Generation Gap: Respondents shared that as much as technology is part and parcel of their profession, the fact remains that some older staff still tend to be resistant because of age. While the younger generation seem to be enjoying technological advancements, it is believed that for the older generation, change does not come naturally. Respondents commented thus:

“First like the older generation, I mean everyone is so set in doing their own thing that they will find it difficult to embrace change. They refuse to accept change. There’s also just the person’s willingness; you get some people that do not want to do anything, they prefer to just pass the buck onto someone else, so it’s like the person’s attitude I’ll say”. (R15)

“Learning some new technology can be a challenge for older staff”. (R12)

Another respondent mentioned:

“Look, from a librarian’s perspective, about 5 or 10 years ago I would have felt extremely threatened because the nature in which information was just being available so readily and the whole Google takeover. It was just like we got side-lined but as time passed, we’ve realised that even though we felt threatened there was nothing to worry about really. We may have felt intimidated by the fact that everybody can get anything from Google; we’ve come to realise that everybody cannot get everything, if you want to add quality to your writing or if you want to add quality to your research you going to have to

use other tools over and above Google and that is how a lot of librarians began to harness and embrace technology". (R13)

Respondents were of the same views regarding the issue of the generation gap when it comes to staff being resistant to technological changes. Most of the respondents further mentioned these common comments: 'it's not my job' attitude, worry about redundancy or redeployment, and older staff who are not willing to get out of their comfort zones.

Part of the solution: Respondents felt very strongly about the inclusion of staff from the very beginning when change is about to be introduced. It is important to get 'buy-in' from staff when as a manager you have foreseen a problem. Involving staff brings in other ideas that would have otherwise not be shared, so it is important to brainstorm. One respondent stated:

"When you sit people down, which is very important, you identify to them, you make it known what is it that is not working, now that is necessitating we need to shift. As the captain for the ship, I'm just steering towards the front, but I realise that in about how many meters there is a big stone, let's sit down. I've highlighted the problem, I'm like let us just be part of the solution so resistance will be close to nil and they know that you're incorporating them". (R10)

Other respondents mentioned:

"Resistance is when people are not part of the planning, when you just going to be imposing, remember you can have a brilliant idea but let people be part of working this idea to making it the reality". (R1)

"When you introduce change you have to be patient with staff, some people take to change very quickly and very easily whereas other people will be more withdrawn wanting to hold onto the old". (R4)

"For people to embrace change, you need to actually embrace what people are saying, let everyone be part of the change". (R3)

Respondents collectively agreed on the fact that change is never easy, especially when you are used to routine. They revealed that staff need to be supported when change is implemented. Management need to explain to them what the new changes are about and how change is going to benefit them and eventually they are going to embrace it. They also mentioned the importance of getting 'buy-in' from staff from the very beginning, where you have to articulate the gap or problem, then ask staff to come with solutions voluntarily. Lastly, it is lack of appreciation that causes staff to resist sometimes. Some of the respondents mentioned:

"In some cases, you know why people resist; it's just because sometimes you find that they are the ones who are implementers but they hardly get appreciation". (R4)

"You have to get everybody on board and make sure you get the buy-in of those people who seem to be reluctant to change. At the end of the implementation process, appreciate everyone, even the ones that were a little reluctant at the beginning". (R8)

4.2.3. Training and development

4.2.3.1 Upskilling

Most respondents recognised that the mere fact that technology changes all the time means that people have to train and be reskilled as often as well. They believe that the solution to resistance and many other challenges faced by managers is continuous training and development of staff. Therefore, if staff is trained on new developments and are knowledgeable, they will assist users more efficiently. Furthermore, they will be on par with the rest of the world. Many respondents shared the same opinion of training and development being the top priority to capacitate staff in embracing new technological developments.

"It's to always train them, for an ongoing development training is forever needed with staff. We can never have a once-off thing and hope that people will adapt, so it's a matter of having to just always channel them to different training courses". (R1)

"Whenever there is new ways of working and new technologies that come into play, we need to have training and development. Staff needs to train and develop, training is for

short term and development is for long term it's the lifelong skills you have. So whenever you get new technology, for example we spoke about mobile technology, we need to go out to staff and tell them". (R3)

4.2.3.2 Personal development

Some respondents mentioned that training and development is not only for work purposes, it is also for personal development. Sometimes it is up to the members of staff to take the initiative to learn and be knowledgeable about what is happening in the information sector. Respondents mentioned:

"Library staff need to be very cognisant of the information economy and how it is evolving, how drastically and dynamic it is. The fact is staff needs to be in the know of all the changes. So, whenever there are conferences taking place, whatever new papers are produced or whatever developments of software and other technological advancements within the library or information arena, staff need to be appraised of it". (R13)

"It is important for staff to have the necessary and continuous training on various current technology to update their skills and keep them abreast of technology. Staff should be sent on training and conferences to stay relevant in their careers and for self-development". (R12)

Respondents confirmed that in most institutions, there would be staff who are technologically inclined and those who are not so technologically inclined. However, the issue of upskilling staff relates to everyone. All staff should have some degree of expertise in the different technologies, whether hardware or software. They can provide basic yet effective and efficient service to users, even if they are a person who manages the shelves. If a student or a user comes to them and requires them to search for a book or an article, they have to be able to offer that service. For more extensive services, the group of specialised subject librarians will take it from there and offer the best possible information experience for the user.

4.2.4. User friendliness

4.2.4.1 Service quality

Respondents agreed that there should be improvement in service quality. It was apparent that most respondents felt the service offered by the library was not only inadequate, but it something that they were not so proud of as well. Respondents mentioned that there are not enough computers, and they came up with solutions and ideas of how service can be improved. Respondents stated the following:

“We still don’t have enough computers, I don’t think we’ll have, but I think it’s something that we need to deal with because we are online, our library is online and if students are unable to access because there’s not enough computers, not every one of them have laptops”. (R9)

“I think our services are adequate I’d say for our users, however if you ask if we could improve I’d say yes we can improve”. (R6)

“You know like when you are standing in front of me you not inconveniencing me, you don’ have to apologise and say ‘I’m sorry for disturbing you’, no, I’m here, and I’m here to serve you, without you there’s no me. That’s the attitude we should adapt”. (R2)

4.2.4.2 Disabled facilities

When it came to user friendliness of the library, respondents had a lot to say regarding the facilities for the disabled. Respondents also commented that the buildings are somewhat catering for the disabled, but they need improvement. These were some of the comments:

“I would say that our buildings are somewhat ok but they are not disability friendly. We still need to do a lot in terms of looking at the needs and proving for the needs of our disability students”. (R7)

“We also do not have software for the deaf and mute on the computers to accommodate these people, you see there is a lot of improvement that needs to be done”. (R14)

It was noted by respondents that there are quite significant problems associated with physical accessibility in the libraries. They mentioned that physically the buildings need to cater more for disabled users; there should be some improvement on that aspect. The steepness was mentioned as one of the major challenges for students in wheelchairs. One of the campus libraries was mentioned repeatedly by participants as one that has a health hazard. They stated that it is not user-friendly in terms of its infrastructure: ‘a building with 6 floors where there is only one lift that is operational’. Respondents pointed out these challenges, as they said they compound poor service delivery.

4.2.4.3 Online Resources

While some respondents commented quite strongly about improvement of service quality and disabled facilities not being of the highest standard, others thought the library is quite user-friendly. Some of the comments praised the ‘24 hour 7 days a week’ opening hours of the libraries, and the readily available electronic resources online. Participants noted that there were surveys done by the library, and out of those the library has been hailed as a user-friendly environment, especially when it came to accessibility of online content. They also mentioned that the library being open 24 hours and seven days a week has assisted users to gain access to print materials without any constraints to time.

Respondents stated:

“I would say we are user friendly, and WMS is very user friendly in many prospects. You can search a whole range of databases at one go with this new product of ours”. (R5)

“UKZN library website very easy to use. We also have videos such as “how to renew books online” that makes it simple and easy. The lcatalogue search box is prominent on the home page with simple navigations that do not overwhelm users. The home page is not cluttered with quick links for easy quick access”. (R12)

4.2.4. Competitiveness

4.2.4.1 On par: technological developments

Some respondents believe that technologically there are some advancements that might be relevant in Western cultures, but not as much in an African context. Others stated that without a doubt there is a lot of catching up with the rest of the world when it comes to technological advancements. One of the respondents in particular stated that her experience overseas was an 'eye-opener' for her. All library online catalogues in the United States of America, for example, have one interface when accessing online articles; you search and it gives you the article immediately. This is something that can be applied at UKZN Libraries. Respondents also mentioned that some functionalities on the online webpage need to be enhanced. For cases when the user cannot get hold of a particular information source, the system should give a link to the inter-library loans functionality. Other respondents pointed out:

"I think we need more exposure on what is working for other institutions globally, how they are using technology to the benefit of the library and the benefit users". (R16)

"When I came here from UJ, I was startled to see 5 or 6 computers, where I come from there are 50 computers for students as OPACs. At UKZN I noticed they have wireless (Wi-Fi) that is free for students and they have access without time limits". (R8)

Other respondents pointed out that other institutions here in South Africa do not have limitless access to Wi-Fi, like UKZN provides for its students. This, they said, puts UKZN on the forefront technologically. The new system has also added to a better reputation for ease of use when searching for information. Furthermore, some respondents believe that UKZN Libraries is on par with the rest of the world. The same respondents mentioned the fact that the Wi-Fi, the library system and research commons are what is putting UKZN Libraries on the map. Respondents mentioned that some technological advancements have to be relevant to the environment it is meant for, and many others believed that UKZN is already competitive. One respondent reiterated:

“I just feel that what we are doing at the moment is, actually, can compete with any other institution, any other library in the world, in terms of our technologies. Obviously, we all have our major problems in terms of space, in terms of having areas where a student can actually go ahead and work and you know have access to a computer”. (R3)

4.2.4.2 Security Issues

One of the issues that came out strongly from respondents was the issue of security when it came to devices. Respondents were asked if devices like laptops, iPads, and tablets can be loaned out as other institutions are doing, especially since the library is going ‘e’ and mobile. There were eminent concerns from respondents, who stated that the challenge is none presence of security inside libraries. They mentioned that they thought it would be a good idea to have the necessary equipment to assist users as far as possible.

Respondents had the following to say:

“To be honest with you I know it’s happening in the first world but if I have to be honest with you I don’t think it’s feasible in our culture, our environment. For a couple of reasons, our security is still not up to where it’s supposed to be. You’re going to borrow an iPad to a child and then an intruder comes and steals that iPad, now how do you expect them to pay”. (R11)

“What I saw in one of the universities, the University of Kansas, is that they have a system where they loan out laptops to students for 2 hours or 3 hours depending on the demand. And they were also lending out calculators, you know little things that students might need, a student might forget a calculator at home and they know the library will sort of provide”. (R9)

It was noted that in as much as respondents wanted to introduce more technological services to enhance users’ experience in the library, they seem to be reluctant because of the issue of security.

4.2.4.3 Social Media: going where users are

Respondent also recognised that in order for the library to be relevant to their users they need to go to where a large percentage of their users are. Social media was mentioned by management as one place the library has not tapped into and where they think service may improve if they make use of that platform.

“Use of social media and other web 2.0 technologies to enhance services should be looked into. Most students are using smart phones and UKZN Libraries need to offer learning opportunities and access to resources via all technological devices”. (R12)

“Because this generation of users who were born in the 90’s, most of them are technologically inclined and do everything using devices, like ‘google’ how to fry an egg - We need to utilise what they use, like cellphones, and find them where they are, which is on social media”. (R2)

Respondents also mentioned that, even though they do not have a strong presence on the social media scene, they would want to start by utilising the main UKZN social media pages, to gain a more competitive edge.

“You know students use these mediums, social networks for research purposes, academics for teaching purposes. Why are we resisting to use it? That is where the user is! So, staff have to be open-minded. That’s why we have to be there, where the user is”. (R8)

4.2.4.3 Knowing your parameters

According to most respondents, technology rapidly grows and changes; it was thus established that it was essential for management to know their parameters when it came to technological advancements and being competitive. Respondents mentioned that in as much as universities are adapting to many technological changes, UKZN has to know which advancement they want and to leave others. Respondents had varying views on this, and they mentioned the following:

“We need to see where we fit ourselves, we need to see where we can contribute to the vision of the university”. (R5)

“Libraries and technology cannot be separated, it is one thing, otherwise we will be irrelevant if we separate the two. It’s a bit tricky because we cannot have everything that comes out, but we need to remember that our industry is about change and technology”. (R10)

In addition to the comments, respondents also stated that they are going to make sure that they are fully trained in terms of new technologies, especially when it comes to devices; but leadership stressed that if a new technological device comes out, they need to assess if it is relevant to the environment. Respondents commented on the fact that some of the technological trends are just a ‘buzz’ and it might not be wise to move with that ‘wave’. One particular respondent mentioned that they feel the library needs to implement meaningful systems that will help improve the image of the institution and add to the bigger strategic move of the whole university. The respondent stated:

“Some of these technological advancements we might have to bypass, because when we looked at it and saw that rather than it adding value to what we do as we fulfil the vision of this university, it’s rather going to take away the value”. (R1)

4.2.5. Leadership challenges

4.2.5.1 Dealing with staff: introducing change

There were indications that staff are generally not inclined to change when change is first introduced. Some respondents suggested that the introduction of change in technological advancements should be done in the process of organising people so that they work together properly and well. Others suggested that staff need to be involved from the onset; leadership needs to find a way to inspire people to enjoy change. Respondents also noted that one of the biggest challenges that leadership face is dealing with staff and their reaction to the introduction of change. They stated:

“It is very important to find better ways to inspire people to enjoy change. One of it is to appreciate little things that people do, for example if they are creating a Facebook page, don’t take it for granted, let it be known to the public”. (R1)

“For people to embrace change, you need to actually embrace what people are saying as well and let everyone be part of it and it brings you a whole lot of other views of how to solve problems”. (R3)

It was observed that respondents knew that technology takes care of the processes that were normally done by staff in the past. Currently respondents mentioned that they are concentrating on building and nurturing relationships with users, as having technology enables this progression. It was also evident that leadership wanted to engage with staff and make them understand all this, so they do not resist the changes that technology brings.

Overall, respondents acknowledged that introducing change can be beneficial to staff. The majority of the respondents pointed out that if people do not know the value of the technology you are introducing, then they are less likely to embrace it. It was also noted by respondents that it is rather tricky, as staff sometimes see technology as a threat. The challenge is to enlighten them and positively encourage them to see change as beneficial. Participants also identified the challenge of educating them about what the technology is about and ‘what’s in it’ for them when you inform staff of imminent change.

Respondents stated:

“As a manager, one needs to point out how technology can simplify their operations, how it can make things easier for them, then they will embrace it”. (R11)

“Once staff embrace technology then you can train them on whatever technology is there. I think we all understand that technology is something that we cannot do without”. (R16)

4.2.5.2 Funding issues

Most respondents were of the same sentiments; the budget or the reduction of change is an issue when it comes to the library. Getting proper funding, budget cuts, and sourcing

funds externally, were some of the issues that emerged strongly during the interviews. Respondents stated they have ideas and are ready to roll with implementations of projects and services that will enhance the image of the library, but the problem is getting enough funding.

“We need a bigger budget, as we are moving away from the traditional library, we looking at a library as a social space, off course we still going to have quiet areas. As much as we going ‘e’ as a library, our buildings are not going to be empty, they will still be a place where users want to hang out”. (R2)

It was reported by respondents that the introduction of specialised services that cater for a technologically-astute user requires more funding for the library. There were concerns that sometimes the library is not regarded as providing essential services in the university. It was observed that respondents felt there should not be any debate about the budget when it came to the library processes. Participants also reported that libraries have evolved from traditional to digital operation, hence information must be accessible in technological format. UKZN Libraries needs to become more of a technological space, but the big challenge is funding.

Respondents mentioned that some of the issues regarding the budget can be resolved by sourcing funds externally. Some respondents agreed that could be a solution to a certain extent, but they suspect the university would want to control their monies, once again making it difficult to easily access university funds.

4.2.5.3 Ways to inspire staff

Management shared the sentiment that training would assist when technological advancements were being introduced to staff. Most respondents agreed that there could be numerous ways to inspire and motivate staff to accept technology. One of the ways mentioned by respondents that leadership can use to motivate staff, was training. One respondent stated:

“It should be compulsory for staff to attend training on new technology and sometimes older staff need to be re-trained or given training in smaller groups to ensure they are learning”. (R3)

“I think training, training, and training! I think also sometimes you don’t see the benefits of something in a training session if you not going to use the knowledge immediately. So, when I think about ways to inspire staff in order that they appreciate new technologies, I would preach to them to use technology after training”. (R2)

Respondents noted that the challenge with technology is addressing the fear of starting to start work with new technologies, but optimism that the more staff used them the more confident they would become. Consensus was that staff should be given technological devices to use and thus develop their confidence. This is one of the ways to encourage staff to love technological advances. It was mentioned also that that sending staff to workshops is good, but if you not going to practice what you have learnt then it defeats the purpose.

Respondents mentioned the importance of working in a team and knowing that working in silos does not benefit either themselves or the institution. It was a general view amongst respondents that being part of a network of librarians assists in learning what is out there. Respondents stated:

“One needs to understand what’s happening their environment, the vehicle that has been given to us as librarians for our professional development is our association which is LIASA”. (R4)

“Whether you’ve been in the profession for a short while or your entire adult life it makes no difference, technology is there, it’s not something that will go away it’s something that we must learn”. (R3)

It was noted by leadership that technology is not something that has come to work against staff as some staff fear. They wanted to make it a point that staff understand that the changes in technology and the implementation of them in the library have come to enhance the services that staff are already doing. What is essential is that staff learn,

understand and embrace these changes so to enhance the services that are being offered to users.

4.2.6. Technologies users appreciate

4.2.6.1 Knowing users' needs

Respondents mentioned that it is important that users are given a platform to air their views and needs, especially because the library is a service-orientated environment. They mentioned surveys and suggestion boxes as well as the issue desk as platforms that users of the library can use to complain or give suggestions. Almost all respondents mentioned that students complain about old computers that are in the libraries. Some respondents mentioned that users will appreciate services offered on mobile technology. Other respondents stated:

“Most users complain about the old computers in the library. Even when the library acquires computers for the LAN, these are always second-hand computers from other LANS in the University”. (R12)

“For me a computer is a basic need it's no longer a luxury to have access to a computer. Everyone has to have access to a computer, as we are also driving the 'e'-vision so if we are driving the strategy we must make sure that our student can access our eBooks on our computers”. (R9)

Respondent felt that students would appreciate more use of social media by the library, and they were aware that users would like to borrow laptops, as there were complaints about how few computers were available at libraries. Most respondents were of the viewpoint that a large percentage of users of the library have smart devices, which includes smart phones, iPhones and tablets. They identified that the library environment needs to accommodate the type of users and devices that users use to acquire information from the library. One respondent stated:

“You know with the trend of everybody having devices that can have access to information; I think reconfiguring our spaces to facilitate for them to be able to use those devices in the spaces”. (R13)

“We need a room where students will be able to borrow iPads and different types of electronic equipment. Although we have laptops on demand services they are for a restricted group”. (R6)

Participants noted that UKZN Libraries was having issues with minimal plug points available for charging devices. There were many other suggestions from respondents that they felt would meet the needs of their users. They included laptop and tablet headphones, because the devices have powerful speakers and can disturb other students. There was a general consensus amongst respondents regarding users’ needs and what services can best benefit them. One of these was mobile technology; as the library is working towards being a fully-online service, it needs to be available on a mobile platform.

4.2.6.2 Importance of innovation

Respondents stated how important and crucial it is that the library looks at innovation for its continuous success. Respondents mentioned the look of the library, enhanced services as well as relations with their users as important factors in making certain that the library stays innovative.

“The whole concept of the library should be relooked at, the space the way it is can be improved”. (R7)

Most respondents mentioned that the entire library has to be comfortable, with modern furniture. They also felt it was time the library moves away from it being a quiet building; they reported that they need to change their mindsets in terms of what the library is today. Another respondent stated that a way to be forward thinking and more innovative is that there are other projects that the library can implement, such as makerspace, as in the library services at UP. They became the first library in South Africa to open a library makerspace, where students and staff have access to some of the latest technology trends such as 3D printing, 3D scanning, electronics and 3D design software in order to enhance teaching and learning. One respondent mentioned:

“We need to look at a makerspace in the library, a place where people can collaborate and use information and resources to become innovative”. (R12)

4.2.6.3 Staying relevant

It was of paramount importance for library management that the library stays relevant, hence the vision for going ‘e’ which is an online library. Respondents expressed their views regarding the fact that UKZN Libraries is not visible on any social media platforms. Respondents mentioned that the library cannot handle the number of users when it comes to print books. There are far too many students therefore perhaps the library needs to introduce a service that will meet with the demand. One respondent stated:

“If possible, the library should have most e-materials, in sense of academic reserves. For these items the users have to come physically to the library to gain access to the information and we have the time frame whereby its 2 hours per student”. (R11)

Respondents stated they wanted to make all prescribed textbooks available electronically so that students will have access to them, thus avoiding the demands and the library traffic. Also, investing more in audio-visuals such as podcasts and YouTube videos will help the library stay relevant. There was a clear indication from participants that they wanted to move from print and go into technology, because users are more technologically astute, so for the library to stay relevant it has to move with its clients.

Most respondents mentioned that staying relevant means staff need to be aware of what other libraries are implementing, keeping abreast of trends in the library sector. UKZN Libraries must devise more strategies, programmes and protocols where more staff are allowed to visit other libraries, including international libraries, so as to bring back vital information regarding international library trends and updates in all areas concerning the library.

Another respondent stated:

“I think we can stay relevant by checking the trends globally, and checking our local institutions as well. Whether it’s DUT, UJ or Wits, we can benchmark on what other

institutions are doing and try to be on the same level or be more advanced if we can". (R14)

In terms of how the library should look and feel, respondents mentioned that libraries today are more of a social space than a quiet place to study. The library setting is changing and management agrees that it is time UKZN Libraries are relevant to their users. Respondents mentioned they needed to create an environment for students to come in and use the library, even if services are fully available online. The interior of the library has to be appealing for users to continue to use the buildings as a social space and study quietly.

4.2.7. Strategy

4.2.7.1 Technology strategies

According to some respondents, to implement technological advancements there need to be some technological strategies in place. Respondents stated that the first place to start is to find out where they are lacking as a library, and find out if the services that are currently offered are what the users want. Respondents stated that they need to find out, by means of surveys, if services offered really benefit or meet users' needs. They also mentioned that it is important to be aware of the expectations of users. In terms of communication, most people have cellphones, so plan to send notifications on Facebook or any other instant text service that will reach the user faster, rather than using 'snail mail' which will take longer. Other responses included:

"For me the best way to introduce change is not the top / them approach but rather to involve people in what you are doing". (R3)

"Our task is to ensure that we support so that the bigger picture of this university, what is the vision of this university, it becomes successful; so, the strategy to me is to ensure that the technology works, it's to actually look at the vision of the university and where it's going and then unpack from that vision and the mission". (R1)

4.2.7.2 Strategies to facilitate change

There was consensus that there needs to be a serious strategy in place to facilitate change. Respondents mentioned that staff need to be made aware, not only of technologies available, but of collaborative technologies that can be used for library services. Respondents further relayed suggestions such as attending conferences, hosting workshops and learning from colleagues externally on what is happening in the industry.

It was further noted that workshops and conferences were seen as strategic moves to develop staff so they can expose themselves to new technologies. These workshops and conferences could also enable staff to meet with their counterparts from different institutions and get to hear what is working for them. Another point that came up amongst respondents is that of allowing staff to come up with ideas as a way to facilitate change.

One respondent said:

“If ideas come from people, people tend to be more embracing to the ideas that are put forward”. (R3)

The plan has to go hand in hand with the University’s strategy. Respondents stated that they need to see where they themselves fit in, and where they can contribute to the vision of the university.

4.2.7.3 Current projects

Respondents shared that currently UKZN Libraries is working on rolling out the electronic library project, where the goal is to have all material, or as much as possible, available online. Respondents stated that there have been some challenges, but they were quite adamant that they are linked to the direction the library is taking. Management mentioned that bringing on change within the institution calls for patience, especially when issues of open access to electronic collections are mentioned. The plan is to also look at digitising print collections and especially our rare collections, of which we have quite a few, especially in our special libraries. It was evident that participants were looking forward to

a much more positive future, as they mentioned that the plans they have will put the library and the institution on a different and global standpoint. Respondents stated:

“Critically at this point we are trying to get our collection more accessible in view of making it electronic”. (R13)

“We will need to focus more of our effort on more learning of the different technologies that are out there”. (R4)

Respondents also stated that progressing means looking at social media tools to seek out their users. They believe that, by doing so, the users will see the library as a relevant and essential vehicle for their information needs. They mentioned that there is a number of initiatives taking place; subject librarians and principal librarians were busy promoting technological advancement tools. For example, they have a team that is working in remodeling our user-education from print into videos, and that project is going well.

4.3. Conclusion

There were different points of views that were expressed on embracing new technological advancements. Most respondents were very positive about the concept; however, those who were indifferent expressing their views politely. Respondents also expressed their concerns regarding the challenges faced by leadership. The common denominator with the group was the awareness of the importance of adapting to current trends in the industry, as well as the resistance to the change concept, with most respondents offering suggestions on how to curb that innate feeling among staff.

A summary of the results was provided in this chapter. Management and leadership experiences from the UKZN Libraries was highlighted. There was consensus amongst respondents that changes in technological advancements is a very important concept and a vital part of the library and information sector. The next chapter discusses the identified themes, linking them with the previous research findings as per the literature reviewed at Chapter Two.

CHAPTER FIVE: DISCUSSION OF RESULTS

5.1. Introduction

The purpose of this chapter is to discuss the findings from the study; the data collected through semi-structured interviews and discussions was to answer the research questions and research objectives. The purpose of the discussion section serves to establish if the research objectives were met and the research questions answered. The research discussion contains the interpretation of research findings and propositions drawn from literature. The emerging themes and sub-themes emanating from the study, as identified in Chapter Four, are discussed.

5.2 Technological changes

The sub-themes in relation to technological changes and how they impact on UKZN Libraries are discussed below.

5.2.1 Adapting to new technologies

The findings of the current study revealed that adoption of new technological applications, be it hardware or software, has increased in recent years. The ability to influence people as changes are implemented plays a very important role in developing and adapting to new technologies. Most respondents indicated that the implementation of a new internationally-recognised library system has put the UKZN Libraries on par globally. According to the Annual Horizon Report (2017), whether change comes in the form of new hardware or new software or a combination of both, the challenge is to help each individual successfully navigate the process. Respondents noted that there were evident challenges when new technologies were adopted, one of them being people who were unclear on the vision.

A study by Hsiao and Tang (2015) indicates that technological development has made the distribution of knowledge resources wider and more effective, thus serving library users even better. Some respondents commented on the positives brought by adapting to new challenges; one of these being the fact that technologies enhance the service offered by UKZN Libraries. Gruca (2010) reveals that libraries have successfully adapted to online activities, taking the opportunities to meet users' requirements and needs. The

statements made by the research participants demonstrated an understanding and knowledge on the subject as they acknowledged that in order to reach users that are out of campus, they would need to enhance their services and adapt to new technologies.

A study by Saunders (2015) indicated that libraries are faced with a challenge to balance new initiatives, such as implementation of new technology, and to incorporate these with existing traditional services. The challenge identified in this study was that in addition to embracing current trends, librarians are also expected to be competent in these technologies because they will then have to teach or train users.

Adapting to technological changes is beneficial to the users of academic libraries who are the clients. The findings of the study indicated that respondents were of the same opinion, however it was evident that there were challenges that were blocking the full execution of these technologies. Many academic librarians globally were seeing the benefits of adapting to new technologies, as it improved user engagement and staff development, as well as providing 24 hour, 7 days a week access to the library.

5.2.2 Academic libraries and technology

Respondents were asked to explain what they considered would make UKZN Libraries more competitive. The results showed that there is still a lot to be implemented to make UKZN more competitive; providing a makerspace environment and making the library fully available electronically, were issues raised. Keralapura (2014) mentions in his study that technology in academic libraries has unheeded geographical barriers for university students, especially as users of academic libraries often complain about time constraints. Through education, individuals become better informed about themselves, their environment and the discipline/profession in which they wish to practise. The findings of the study indicated that academic libraries, as hubs for information which can make that information meet the needs of users, have no choice but to move with the technological tide.

The challenge is that the traditional role of an academic library has meant that staff must strive to rethink and repurpose what a library is and what a library does. Nevertheless, respondents felt that technology was an important part of their job since it enabled them

to offer a better service and be more proficient. According to respondents, implementation of new technological developments in academic libraries can encourage staff to develop so they can be as 'savvy' with the latest technologies as the library users.

UKZN Libraries has users from different cities, and international students from African, as well as other, countries. Implementation of new technologies will assist in reaching users wherever they are. Hsiao and Tang (2015) reveal that technological development has also made the distribution of knowledge resources wider and more effective, thus serving library users even better. Most participants in the study agreed that libraries in the past only contained print material, but modern libraries are now enabling a wider access to information and knowledge in many formats and from many sources.

Dale et al. (2011) confirm that the advent of affordable computers, personal devices for individual use and the development of the Internet have transformed the use of library services and the ways libraries operate. Librarians relayed that technology offers users an option of accessing information remotely without having to step foot inside a library building.

5.2.3 Mobile technology

Mgquba and Underwood (2015) explain that mobile technology, as part of the new technologies embraced in different sectors worldwide, has changed and has had a significant effect on the way people live, work and play, making it a concept that cannot be ignored.

Ying and Lin (2016) reveal that Internet access on mobile devices has altered not only the way people communicate, but also affected the way users search, retrieve and use information to address their daily needs. Respondents alluded to the fact that there is an urgency pertaining to the development of mobile technology at UKZN Libraries and within the information services environment. Senior management felt the role mobile technology plays in academic libraries is important for making services accessible for users.

There was consensus among respondents regarding the significance of the concept of mobile technology and its value. Librarians agreed that the library cannot afford do without mobile technology as it supports the library's strategic plan of enhancing its services.

Raju (2014) argues that the dramatic changes caused by mobile technology as well as the overall technological advancement wave, have impacted the skills set of librarians, and has significantly threatened the knowledge requirements of LIS professionals practicing in the field. The results of this study show that most librarians require upskilling and consistent engagement with experts in the field of LIS in order to enhance the services they provide. Moreover, the library will have an added advantage when it enables the process of mobile technology to improve its services. Compared to the way they were framed in the past, academic libraries look a lot different in the present day, therefore the library that does not exist in a mobile application format, is almost non-existent. Petersen and Louw (2014) find that librarians need to provide library websites which are easily accessible via mobile devices, as their users are using mobile phones instead of laptops and desktops to search the catalogue for information sources. The study found that respondents were of the belief that mobile technology exists within UKZN Libraries. They also reiterated the need to improve the services they offer and further pointed out that the concept of mobile technology needs to be revisited. Saravani and Haddow (2011) advocate that the fundamental role of librarians is to provide access to information and effective delivery of information services. They further state that mobile devices have added a characteristic to this role, one that involves new abilities, skills and knowledge to make certain the needs and expectations of users are met.

5.2.4 Going 'E'

Kwanya, Stilwell and Underwood (2010) find that there was an oft-stated fear that knowledge seekers will bypass institutions that are perceived to be slow, unresponsive, unimpressive, boring, and unattractive, in favour of a more direct approach to services. This study revealed that librarians are keen on the going 'e' strategy, therefore proving that they are going on a progressive route technologically. Miller (2011) suggests that one way to retain knowledge seekers is to keep the library updated with technological developments, thus the reason for library management of UKZN to effect the 'e' strategy.

Muhambe (2012) finds in his study, that Library 2.0, which is associated with web applications that enable information sharing, user-centered design and collaboration on the Web, has not been fully implemented in UKZN Libraries. The study finds that there is minimal social media presence of UKZN Libraries. Apart from a blog page available on the library's webpage, the library does not exist on social media platforms. This should be a big concern for librarians, as the lack of digital presence translates to no instant online contact with users. A study by Prensky (2001) finds that students have changed radically, especially with the emergence of technology. Today's students are 'native speakers' of the digital language of computers, video games and the Internet, meaning they are constantly present online. Respondents mentioned that the initiative of the library being fully available online (the 'e' strategy) would be to meet users where they are which is on digital platforms.

This study found that library management felt going completely electronic as a library will best serve and produce an efficient service to its users. Gruca, 2010, reveals that remote accessibility to information sources has become a digital extension of the traditional library building, its collection and services. Thus, it is safe to assume, based on these findings that UKZN Libraries, as part of the premier university of African scholarship, should be far ahead with technological advancement, but that it is not quite there as yet.

Library management were resolute about the decision of going 'e' as they stated one of the biggest reasons for this move was about the space in libraries, which is not able to cater for the large number students the institution currently has. The annual report by UKZN (2015) confirmed that the number of students registered at UKZN was 45,638 and libraries only have capacity for about 4,500 students. This therefore meant that it was best to provide a service that will enable users to access library services remotely so as to limit the number of walk-ins.

5.3. Embracing changes in technology

The theme of embracing changes in technology was formulated from the responses of the participants when asked to respond to the question regarding how well staff is embracing technological advancements.

5.3.1 Benefits of change

There are benefits in embracing change. Respondents mentioned that technology brings changes but it also offers efficient provision of services by staff. Previously when library services were manually based, users used to come to the library and request printed sources of information. Retrieval of these sources was a dreary task for librarians, which made for inefficient service provision. This study found that technology provides faster, better and efficient service for users of UKZN Libraries.

UKZN librarians revealed that there has been a lot of improvement in serving users since the advent of more recent technologies. According to Rendon (2014), librarians have evolved to meet the changing needs of their users and by embracing technological advancements they are still relevant because of their knowledge, skill and passion. This means as technology advances so do the skills of librarians.

There are benefits for both librarians and users that were highlighted by respondents; one of these was the new library system WMS. Library management mentioned that while it was difficult at first for staff to accept the change, they eventually achieved the proficiency the system facilitated. Top management revealed that the new library system has brought about a lot of welcome changes technologically.

5.3.2 Challenges of change

Everything has its advantages and disadvantages, especially in the world of technology. Cassidy et al. (2014) found in their study that technology has advanced from desktops to laptops to mobile technologies. Now libraries are expected to provide cost-effective and reliable access to information, using state-of-the-art technology which is easy to use for both users and librarians. This has posed some challenges especially with the case of UKZN Libraries, as with every advancement of technology, changes occur.

The librarians revealed that technology is rapidly changing and sometimes it can be overwhelming. They mentioned the main challenge is keeping up with the trends, as the library sector and information services is synonymous with changes in technology. Brundy (2015) identifies that academic libraries are facing times of exceptional challenge and

incomparable change, which thus explains the difficulty library staff face when changes are effected.

Library management pointed out that when changes take place, most of the staff is usually not ready for it and they fall somewhat behind while others move forward faster with the change, which then causes further challenges. The findings revealed that some challenges with changes in technology could be resolved if top management could procure devices that users of UKZN own, such as iPads and Apple Mac computers. Librarians commented on the challenges they face regarding exposure to the latest devices, such as when their users come to the library with their devices and request assistance. Users expect an excellent service, and currently the library does not offer its best service as it lacks the usage of iPads and Apple Mac laptops.

5.3.3 Resistance to change

It has been found that staff at UKZN Libraries are no exception to resistance, especially when change is affected. The study found that at first the fear was that technology will replace their jobs, thus the resistance to changes in technology. Some changes in the academic library environment are unplanned, which makes staff succumb to resistance when the changes occur. Vassilakaki (2014) suggests that change has to do with progress most of the time. He further mentions that libraries have experienced some serious unplanned changes in the recent past.

Sometimes resistance has to do with lack of confidence in what is being implemented. The study revealed that librarians lack trust, confidence and feel excluded during the composition stage of introducing change. Smith (2011) maintains that the change process may be delayed if there are no regular and constant discussions about the purpose as well as the benefits of change. Based on the findings, library management could have given staff more time to process the change that was about to take place, and so avoid issues of resistance.

Other issues that emerged included 'it's not my job' attitude; lack of appreciation, redundancy and redeployment. However, respondents agreed that implementing new technological advancements can be a challenge; staff who are used to routine, and older staff who are not willing to get out of their comfort zones tend to resist a lot. The results show that the important thing is to get the 'buy-in' from staff from the very beginning in order to avoid resistance.

Some of the staff felt excluded from the very beginning when change was introduced, which resulted in resistance. The issue of younger and older generations was pointed out and was seen by some respondents as a reason why some staff resist change. Pinto and Little (2014) find that age is one of the most important variables influencing technology acceptance, and that older librarians are less prone to adapt to new technologies. The study discovered that librarians today should do away with the notion of being non-adaptive to technology and push themselves to be open to this technological era. The nature of their job demands for them to be technologically well-informed.

5.4 Training and development

5.4.1 Upskilling and career development

Cameron and Green (2015) state that effecting change, such as introducing new technological systems, requires that management approach the process with both the organisation and the individual in mind. This means that management should want to move with the times and reach the current user of the library; staff who are offering the service should be brought up to speed with changes and be reskilled in order to meet the demands of the current users. Upskilling refers to learning additional skills to what you already know. The study found that librarians are aware that technology changes all the time, and they are willing to be trained and upskilled. The results show that most respondents thought that the solution to resistance and many other challenges faced by management is continuous training and development of staff.

Raju (2014) reveals that higher education libraries in South Africa offer state-of-the-art LIS services to academic and research communities, hence the universities in the country are leading institutions on the African continent. She further states that the analysis of

knowledge and skills requirements for the modern technological academic library is important. Therefore, if staff are trained in new developments of new technological advancements they will assist users more efficiently. The study found that respondents shared the same opinion of training and development being the top priority to capacitate them in embracing new technological developments.

Some participants acknowledged that training contributes to career development as well as personal development. It was mentioned that staff are to take the initiative and be proactive in acquiring more skills in order to remain relevant in the LIS sector. Pinto and Little (2014) identify that librarians should consider new technologies, not only in terms of how they can benefit existing services or support users in the long term, but in terms of how they can also benefit professional development and growth in the short term. Hence the importance of training and upskilling. In every institution or organisation there will be employees who are technologically 'savvy' and some who are not. However, respondents agreed that the issue of upskilling staff relates to everyone. Staff should have some degree of expertise in the different technologies whether it is hardware or software. Kilfoil (2015) pointed out that libraries are continually changing which impacts on the skills requirement of librarians today. This means that management are left with no choice but to upskill their staff.

5.5. Technological developments

It was discovered that librarians believe that there are some technological advancements that are relevant in Western cultures but might not be relevant for our users. Most respondents mentioned that there is a lot of catching up with the rest of the world when it comes to technological advancements.

5.5.1 Service quality

The issue of improvement in terms of services offered came out very strongly among respondents. Most respondents felt the service offered was inadequate, while others thought they were delivering a good-enough service to the users. Respondents felt there should be more computers available for students in libraries and others felt the library buildings are not fully accommodating to the physically-challenged user. Management

spoke of personalised service for users of the library, which is something they are going to investigate once the online library is fully operational. Cervone (2010) suggests that librarians need to look outside the walls of the library and apply the lessons learned from the commercial sector in order to offer quality services to their clients, because the expectations of library users are being set in the commercial sector, not in libraries.

The study found that library management would like to improve on service quality and be client driven. Library management wanted to promote an environment that says 'I'm here, and I'm here to serve you', and not one in which the users felt like they were inconveniencing the staff. Mbambo-Thata (2010) says that library information services such as searching the library website, managing patron records, requesting learning materials and searching certain databases, are basic services that are to be offered with high service quality in mind. This means management has a responsibility to meet and exceed user expectations.

5.5.2 Security issues

There were concerns, mentioned by respondents, regarding the library offering devices like laptops, iPads, and tablets as service to users. With the advent of technology and libraries being fully present online, many academic libraries worldwide, especially in First World countries, are offering this service as they have explored this service and its benefits, such as improved user engagement and staff development. UKZN Libraries seemed to be falling behind on this particular trend, but respondents mentioned they are mostly concerned about security issues if this service is offered. There is not enough security presence currently in the libraries and if users were to lose their device, it would create a big loss for the library. However, some respondents felt that adding this service to the library would further improve the quality of service offered.

The study found that respondents wanted to introduce more technological services to upgrade users' experiences in the library, but they seem to be reluctant because of the issue of security. There are benefits for both librarians and users with regards to technological devices. For librarians, they can finally be exposed to the latest hardware

and be enabled to serve their users proficiently. Users would receive a First World academic library experience and enjoy a heightened service, with no extra cost to themselves.

The study revealed that offering unique quality services promotes the library and encourages large numbers of users to use the library more willingly. Thus, UKZN Libraries should take heed of the advantages of these services, not only to catch up with developments in technology but, more importantly, to offer services which will resonate with their users.

5.5.3 Knowing your parameters

This theme came out of the interviews while discussing the issue of relevance and advancements in technology. Librarians have seen the rate at which technology rapidly develops, and they established that it was essential for management to know their parameters. For instance, Rendón (2015) mentions academic libraries in Europe are employing technology in ways almost never envisioned, for example, GPS apps that help locate material inside the library, mobile apps that allow patrons to access library services, access to 3-D printers, binding services and book delivery robots. Librarians at UKZN were of the same opinion as Rendón (2015) opinion that they can do without such technological advances; they also mentioned they know what fits with the environment of the university. It was found that librarians know their parameters because they know the overall vision of the university and that is what guides them.

While libraries and technology cannot be separated, the vast array of technologies requires that their adoption be strategically managed. Respondents revealed that while they strive to stay relevant, they also need to keep in mind the vision and mission of the university and be guided by that when introducing new technologies. Some librarians mentioned they do not believe in implementing changes in technology for the sake of implementing them. The study found that management of the library consider if any of the technological advancements will add a value to the library before acquiring them.

5.6 Leadership challenges

According to Duren (2013), change in libraries requires planning and organising as well as certain leadership competences. Leadership needs to find a way to inspire people to enjoy change. Respondents noted that one of the biggest challenges that leadership faces is dealing with the reaction of staff to new technological advancements introduced in the library.

The study found that for staff to embrace change, leadership has to observe their needs, and really listen and understand what people are saying (Brundy, 2015). The majority of respondents pointed out that if people do not know the value of the technology being introduced, they are less likely to embrace it.

It was discovered that the important thing that makes people feel valued is to let everyone be part of the change in its initial stage. This assists in bringing together the staff for a unified positive outlook regarding change (Brown & Osborne, 2012). Library management responded by stating that the challenge is making staff understand that technology has taken care of the things they were concentrating on before, such as administrative work. Now their works about creating a personalised relationship with users; that is what having technology will allow librarians to do.

There were indications from the findings that library staff need to continue learning and exploring new technologies such as social media platforms and instant messaging applications for information sharing purposes. There was a concern that UKZN Libraries takes time to introduce technological advancements of any form, thus making librarians lag behind their counterparts from other institutions. There needs to be an improvement of knowledge sharing, using advancements in technology.

5.6.1. Funding issues

Leadership in libraries face fundamental issues regarding funding. Librarians mentioned they are providing a very essential service, and do not think there should be any debate about finances and budget when it comes to upgrading services of the library. Chiware and Mathe (2015) state that essentially everything in and around the library is changing:

services, technologies, organisational constructs, ownership as well as access policies. Thus, leadership needs to employ a more vigorous approach in making sure that they receive an adequate budget for the library.

The study revealed that the issues regarding the budget can be sorted by sourcing funds externally, outside the parent institution. Respondents stated that even if they are to source the funds, the University would want to control their funds which will make things difficult and cause challenges in accessing those funds.

5.6.2 Ways to inspire staff

There was a general agreement amongst management about what would assist when technological advancements were being introduced to staff. Most respondents agreed there might be numerous ways to inspire and motivate staff to accept technology. One of the ways mentioned by respondents is that leadership can motivate staff by sending them to training, thus empowering them to perform better at their jobs. The study found it was difficult for leadership find ways to inspire and motivate staff. Perhaps one way is to make training compulsory; for staff to attend training on new technology and older staff to be re-trained, which would encourage them to get out of their comfort zones.

Martell (2012) states that it is mandatory in the twenty-first century to provide our society with value-added services; professionals need to be well-equipped and aware of the current trends. Library management acknowledged that there was a demand for services that would add value to their users and stated that the current move of setting up an electronic library is the solution to many issues they face on a daily basis. The study revealed that exposing staff to new technologies used in other institutions could help inspire staff to want to have those technologies implemented in their own workplace. Therefore, it is essential for leadership to send librarians out to explore what their colleagues are doing in other institutions.

5.6.2 Innovation and relevance

Raju (2014) mentions that new approaches of academic communication, expansion of the library's space via knowledge or research commons, the explosion of social media, and the increasing growth of mobile devices and related applications have collectively

transformed the traditional academic library beyond recognition. A librarian stated that the whole concept of the library should be revisited; the space as well as the 'look and feel' has to be improved to accommodate the modern user.

The study found that librarians at UKZN see the importance of innovation and have ideas on how to improve – not only the service but also the physical buildings of KZN Libraries. Jantz (2012) agrees, stating that there are undeniable environmental changes that call for innovation in academic institutions. To remain relevant, innovation has moved from being a consideration to being a necessity. This indicates that despite the current challenges associated with funding issues and staff resistance to change, UKZN library management can benefit more if they continue offering relevant, timely and efficient service to users by being conscious of innovations surrounding the library sector.

This study found that librarians at UKZN are not fully relevant to their users, as users are mostly found on social media platforms, and this poses one of the major challenges faced by library management. Respondents admitted that the library has a challenge in providing enough materials for the number of users who need print books. Therefore, perhaps the library needs to introduce a service that will meet the demand, such as providing prescribed materials as e-books, so that every user can have access without restriction. Thus, the study found that UKZN Libraries can solve a lot of challenges they are facing by moving the print sources across to electronic platforms.

5.6.3 Strategy and way forward

According to some respondents, meeting the needs of users through technological advancements needs a strategic plan from management. Respondents noted that the first place to start is to find out where they lack as a library and, if the services currently offered are needed by users. In order to facilitate progression, library management are challenged with making sure that staff are on board with the changes, and encouraging them to see the bigger picture when it comes to embracing changes in technology. Pugh (2016) believes that if librarians are certain they are key players within a team, or simply believe that the new technology will be better than the old one, they may be able to embrace change.

Surveys were mentioned by librarians as one way to find out user needs. Library management expressed the fact that they might not be able to meet all the needs of the users, but being aware of them will make a tremendous difference. Leadership of the library emphasised the vision of the university as a whole, stating that they need to ensure that they support this bigger picture. They stressed that for the library to become successful, the strategy is to ensure that the technology being implemented actually goes with the vision and the mission of UKZN. The study revealed that implementation of technologies previously was influenced solely by looking at implementing the latest trends in the library sector. Librarians mentioned that progressing requires that they implement technologies based on the needs of UKZN users.

The goal of UKZN libraries is to have all materials available online, however respondents expressed concerns and mentioned there have been some challenges regarding this process. Management mentioned that bringing on change within the institution calls for patience, but it was noted that they were quite positive and excited about this venture. The study revealed that leadership's plan is to consider digitising the print collection and rare collections, which they have housed in special collections libraries. Based on these findings, one can assume that UKZN library management are aware that this will globally elevate UKZN Libraries.

It was evident that librarians overall want to embrace changes in technology and believe it would improve library services. Respondents stated that technologies increase access to information and users can access the library at any time wherever they are. Usage of mobile technology was deemed a fundamental part of an electronic library which library management are in a process of implementing. Furthermore, it was found that technologies would promote a personalised service between users and librarians and this could result in faster real-time communication. It did not come as a surprise that they were aware of the advantages these technologies bring, even though some librarians were reluctant to accept that they lagging behind when compared to their counterparts. It was found that librarians are already doing their best to communicate and assist users, but the implementation of new technologies should contribute to enhancing customer service and communication, which will impact positively on library usage.

5.7 Conclusion

This chapter discussed the findings as presented in Chapter Four. It was found that there is an awareness of technologies that can enhance the services offered by the library, however library management are faced with real challenges such the issue of funding as well as of security so as to implement current technologies. The challenges relating to embracing changes in technology and ways to enhance library and information services were discussed and it was evident that resistance because of how rapid changes in technology are could be the reason why some librarians are skeptical. The study recommendations and conclusions will be presented in the next chapter.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The main objective of the study was to assess the extent to which changes in technology within UKZN Libraries are embraced, and to investigate to what extent UKZN Libraries has advanced technologically. The aim of this chapter is to summarise the findings of the study, to draw conclusions from the findings, and to make recommendations based on the findings presented.

Despite the abundance of literature on studies on technological trends in the information-services industry, there was no particular study on whether embracing changes in technology is achieved or not within academic libraries. As a result, it became a challenge to correlate the current study and previous studies. Nonetheless, the study was inspired by a need to explore the relevance of current technologies and staff at academic libraries and how well they are handling the rapid changes. Research questions were:

- How can UKZN Libraries adapt to technological changes in teaching and research?
- What changes are required to make UKZN Libraries more competitive, user-friendly and useful to the end-user?
- How can technological change be embraced in the UKZN Libraries?
- How can library staff be capacitated to embrace change in technology at UKZN Libraries?
- What are potential areas of resistance to change that may be experienced in implementing technological changes in UKZN Libraries?
- What strategies can be identified to facilitate change in technology in the UKZN Libraries?

The conclusions and recommendations that follow below are based on the findings as presented and discussed in Chapters Four and Five respectively. It should be noted that

the research questions for this study were generated from the preliminary literature and are the basis for the conclusions. However, a summary of the study so far is given and this follows next.

6.2 Summary of the study

Chapter One provided a brief description of how technology in academic libraries has changed the way librarians deliver information to their users. It further highlighted the purpose for such a study and contextualised it in terms of the problem statement. The methodology used for the purpose of the study and the limitations of the study were discussed. It was envisaged that the findings from this study could contribute to improving the current use of technological devices in the libraries, and ultimately contribute to improved service delivered by the library.

Chapter Two discussed the involvement of technology in academic libraries and how it has changed the way librarians deliver information to their users. This seems to be inevitable since most users have become more technologically 'savvy' and expect their libraries to move with them at the same pace in terms of innovation and technology. Therefore, academic libraries must take their mandate of delivering a relevant, timely and efficient service seriously in order to remain relevant. Finally, change management theory, as the framework underpinning the study, was presented.

Chapter Three outlined the research paradigm, methodology, strategy and design used. A detailed explanation of the selection of participants, data-collection methods, analysis and rationale beyond a particular choice was provided. Data are presented in a format that is meaningful and allows the researcher to gain a deep understanding of the information.

Chapter Four presented the results. Management and leadership experiences from the UKZN Libraries were highlighted. There was consensus amongst respondents that changes in technological advancements is a very important concept and is an essential part of the library and information sector.

Chapter Five analysed and discussed the findings as presented in Chapter Four. This discussion was based on the research questions presented in Chapter One and outlined, once again, above.

6.3 Key findings

This section summarises the key findings of the study as per the research questions. The purpose of the study was to determine whether UKZN Libraries are embracing changes in technology.

6.3.1. How can UKZN Libraries adapt to technological changes in teaching and research?

The first research question sought to find how UKZN Libraries adapts to technological changes in teaching and research. The study findings indicated that the respondents were already adapting to new technological advancements, although there were challenges when new technologies were adopted. These challenges included, amongst many, the uncertainty of what that particular technology system was going to mean for staff. It was evident that staff needed clarity on the vision behind the implementation before the initial introduction of the new system. The new library system (WMS) was introduced in January 2016 and the study found that it has enhanced the services offered by the library.

This verifies what Hsiao and Tang (2015) state, that technological development has made the distribution of knowledge resources wider and more effective, thus serving library users even better. Academic libraries in the past contained only print material; modern libraries have created more platforms and broader avenues for access to information. The study found that UKZN Libraries has started making their information sources more accessible in many formats but there is still a lot to be done.

UKZN Libraries has successfully made its resources more accessible online and this has translated to meeting the needs of users who do not necessarily have the means to come inside libraries. Thus, UKZN Libraries has adapted to new technological changes, and assisting in the teaching and research of the institution.

6.3.2. What changes are required to make the UKZN Libraries more competitive, user-friendly and useful to the end-user?

The study found that there were some mixed feelings regarding competitiveness. Most respondents believed that the library is very competitive while others stated there is a lot of catching up with the rest of the world to be done, when it comes to technological advancements. Regarding the ability to use smart devices and be on social media platforms, the study found that staff still had a lot of catching up to do. On accessibility to online information, it was found that UKZN Libraries is doing well and can expand on what it already has online.

The study found that UKZN Libraries has provided physical accessibility to its physically-challenged users. However, respondents mentioned that it was not enough. Issues regarding elevators being out of service, ramps being too steep for wheelchair-bound users, as well as no reading software available for visually impaired users, were big concerns. Respondents felt very strongly about the library insufficiently serving physically-challenged users. It was thus found that the library was not user-friendly. Technologically, respondents felt that having an off-campus module on their website for users outside the university premises, thus making information sources available online, was helpful. The study thus found that UKZN Libraries, technologically, could improve on the services already available online.

6.3.3 How can technological change be embraced in the UKZN Libraries?

There were several findings that emerged when respondents were asked about embracing changes in technology. Respondents noted that there are many positives in accepting technology, one of these being the relevance it brings to the current user. Moreover, participants revealed that technology plays a big role in making things easier for them to do their jobs. On the other hand, respondents said the library does not have enough resources to adopt and implement the new technologies. Molaudi and Du Toit (2010) state that the involvement of technological development in the academic library has influenced change in collecting, storing, and managing information. It is thus essential for staff to embrace change because the way that work is executed has also changed drastically.

Technology enhances library services in that once you have taught users how to find information on online databases, for example, users become independent and able to access information sources by themselves without having to physically come into the library. The study found, however, that for some librarians technological changes can be overwhelming. There are always changes that need to be incorporated in their job description, which has posed some challenges for those librarians.

It was found that management experienced many challenges with staff when technological changes were introduced. The study found that lack of communication was one of the factors contributing to the challenges. It was found that staff felt like they were left out at the developing phase, and only when implementation was introduced were the staff included by the leadership. The study found that technological changes can be embraced by UKZN librarians because they understand that the library sector is constantly changing and improving. However, staff want to be involved from the beginning, from planning to the implementation of the technological advancements.

6.3.4. How can library staff be capacitated to embrace change in technology at UKZN Libraries?

The study found that staff can be capacitated to embrace technological changes by management sending staff for training and exposing staff to new technologies, be it hardware or software. Librarians stated that lack of exposure has caused staff to be disengaged with technological changes, thus causing staff to be unwilling to learn about new developments in the library and information sector. The study found that more exposure is needed for librarians to continue being passionate about their jobs. For example, the library needs to acquire at least a few smart devices for librarians to master, so they know how they work, in order to assist users who come to them for assistance with the same devices.

Respondents mentioned a mechanism that could capacitate staff in embracing technological changes. The study found that there were minimal training workshops presented to staff, thus not increasing their awareness of the latest technologies. The study also revealed a lack of funds in libraries hindered technological changes and consequently little training for staff. Hence more funding is required to send staff on

training and also to expose them to new trends by sending them to conferences and workshops that present the latest in LIS.

6.3.5. What are potential areas of resistance to change that may be experienced in implementing technological changes in the UKZN libraries?

It was anticipated that staff may experience areas of resistance to change when new technological advancements are introduced. The study found that initially, when change was introduced, there was fear of the unknown from most respondents. Participants mentioned issues ranging from redundancy to the relegation of issues to age ('I am too old to learn something new'). Kenan (2012) identifies that while younger staff members may be very comfortable handling new technologies, some older staff members may exhibit an inherent resistance to adapting to or embracing change that comes with these new techniques. Thus, the study found that it was the older members of staff that were reluctant to embrace new technologies.

The study revealed that some staff members were unwilling to change or accept changes that came with technologies. Shortage of staff and lack of expertise to run the technologies were mentioned by respondents as enablers of resistance. The study found the staff at the libraries have the necessary library qualifications and are skilled enough to use technological devices which are a prerequisite to provide library and information services; but what emerged from the results is that even so, some staff members lacked enthusiasm in the implementation of technological changes. Lack of communication from top management to staff members was also found to be a major contributor to resistance to change. The study found that when respondents felt left out and not included they resorted to resistance.

6.3.6. What strategies can be identified to facilitate change in technology in the UKZN libraries?

Management mentioned that there are strategies in place to facilitate changes in technology within UKZN Libraries. Some of the plans include sending staff for training and exposing them to new technologies that could benefit the libraries and the institution

at large. Respondents stated that there needs to be more research done in terms of finding out what is 'on trend'. Attending workshops and conferences to expose staff to these new technologies was mentioned as well. Associating with colleagues from other libraries to see what is 'working for them' was another mechanism to introduce staff to new technologies, and thereby facilitate change in technology use in the library.

The study found that leadership of UKZN Libraries was aware of many issues emanating from changes in technology, and had a strategy and several plans in place to improve services. The study also revealed that funds, security issues and lack of communication were challenges that management were dealing with and working on improving. Some of the challenges that management faced, as stated by respondents, included having senior executives who did not support the library, resulting in a lesser funds allocation. Management mentioned having a new executive who supports the library's vision of going 'e' as a great relief, and they are hoping for much-deserved increased funding that will facilitate the technological change needed for UKZN Libraries.

6.4. Recommendations

Based on the findings and conclusions of the study as noted above, the following recommendations are made that could help UKZN Libraries prepare themselves to adequately adopt, implement and embrace changes in technologies for the provision of enhanced library services.

6.4.1. Introduction of Smart Devices

Respondents reported having the skills to use internet-enabled devices, such as smartphones, that provide the basis for required skills to provide library and information services through mobile technology and many other platforms available. Respondents also reported that the staff did not have enough exposure to different types of devices, as well as to various available applications and software. It is thus recommended that thorough research be done on the relevant skills the 21st century librarian should have in order to remain relevant in this technological peak. Several factors were considered and this brought about many different responses from the respondents, as seen in Chapter Four. It is recommended by the researcher that UKZN Libraries implement and make use

of different technological advancements, such as mobile phone technology and be more present on social media platforms.

6.4.2. Continuous improvement: MakerSpaces

Embracing changes in technology can be very beneficial to UKZN Libraries as it is an increasingly prevalent part of the library sector, moreover by rejecting what is happening there is a risk of being left behind and becoming redundant. Many academic libraries have adapted makerspace projects as part of reimagining their spaces and services. The recommendation is that UKZN implement makerspace so as to stay relevant and to remain abreast of technological developments. It is recommended that the library make use of technological changes as they come along, because most of these technologies will cost the university nothing, for example social media pages, which will not only improve communication between users and librarians, but may also increase the usage of the library. There is also the possibility of such technology playing a role in increasing the research output of the University by providing quick, reliable and easy access to information.

6.4.3. Staff training

Staff training with regard to the provision of library services via mobile technology: given the uncertainty of the findings regarding expertise and knowledge, the researcher recommends that staff be trained more often to meet technological changes and be up-to-date with technology, especially as technology helps with more successful and proficient dissemination of information. Once the staff are trained specifically for using most of these technological devices as well as the software to provide library and information services, it will improve the services offered by UKZN Libraries. However, while making this recommendation, the researcher acknowledges the budgetary concerns as expressed by the respondents. It is the budget which forms the basis of the next recommendation.

6.4.4. Budget

It is evident from the findings of the study that budgetary constraints would be an inhibiting factor in the adoption and implementation of additional technological advancements.

However, given the clear advantages associated with changes in technology, it is recommended that both the library and the university management give urgent attention to ensuring that funding is available to adopt and implement the technology. Consideration should be given to UKZN Libraries having a separate budget dedicated to technological advancements. This would arguably assist in facilitating such advancements.

6.4.5. Training and workshops

Library workshops can improve for academic libraries, they can use podcasts to teach searching techniques and provide tips. Hosting of conferences and workshops so to provide staff with much needed upskilling for professional service outputs. When the library becomes an 'e' library, many services have to be available, such as referencing techniques, information literacy skills and many others that may be offered virtually.

Academic library management and leadership have increased dramatically. As leaders, academic librarians are expected to influence, motivate and challenge their colleagues; it is thus recommended that leadership at UKZN Libraries follows suit.

6.5 Recommendations for further research

The findings of the present study give an overview of the status of technological changes embraced by UKZN Libraries. From these findings, fundamental approaches could be developed to enhance the services offered by the library and better interaction with users can be established in the future. Considering the fact that little research of this kind has been done at UKZN, there is therefore a need for more studies to be done relating to embracing changes in technology. These could include:

A study to determine the UKZN Libraries users' needs and the most used technologies in accessing information. Conducting similar studies in quantitative or mixed methods at other South African university libraries in order to determine if which results, in terms of the benefits and challenges associated with changes in technology, would add more to the present study. A more in-depth study, based on the findings of the present study, but focusing on the feasibility of acquiring more technological devices and software in UKZN Libraries.

6.6 Conclusions

From the literature reviewed and the findings of the study, it was revealed that when compared to the 'traditional' services of an academic library, university libraries have progressed quite exponentially as technology changes. Traditional skills for librarians, like written and verbal communication, are still important but the capacity to create and nurture partnerships is being encouraged in the current technological environments. The study looked at embracing changes in technology and it was evident that technological advancements can add much value to academic libraries. The literature reviewed indicated that those academic libraries which have implemented electronic processes in the way they delivered their services show a significant improvement in communication between the libraries and their users in the following aspects:

The results of the present study show that the issues of accessing and sharing information were among the main concerns of respondents. Based on the results on this study, technological changes and tools have not been fully embraced by library staff in UKZN Libraries. Included among those tools are Facebook, Twitter, Instagram and other social media platforms. It was also evident that these tools are not utilised in terms of the amount of collaboration and interaction with users that can take place. As reported by Miller (2005), there is an oft-stated fear that many knowledge seekers will bypass institutions that do not use new technology, or are perceived to be slow, unresponsive, and irrelevant. UKZN Libraries, therefore, may be faced with losing users to institutions which provide the benefits of the current technologies. For this reason, it is crucial for UKZN Libraries to embrace these technologies despite the challenges presented by problems such as bandwidth, costs, lack of infrastructure and lack of skills and training.

It is important to note that UKZN is an international institution and has students from universities whose libraries have already adopted many technological advancements. The results of this study have shown that UKZN Libraries needs to give serious attention to technological changes should they wish to ensure their continued relevancy and compete on an international level.

6.7 Areas of Future Research

Research can be conducted to evaluate the effectiveness of change management process. Other library staff apart from library heads should be analysed to know their perception about change management. Private sector libraries trends towards change management is also potential research area or the research can be done on the comparison of both sectors.

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APPENDIX 1a: INFORMED CONSENT LETTER

UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP
Master of Commerce in Leadership Studies Research Project

Researcher: Nokuthula Ndlovu (0312607015)

Supervisor: Cecile Gerwel Proches (0312608318)

Research Office: Ms P Ximba (0312603587)

Dear Participant,

I, Nokuthula Ndlovu am a Master of Commerce in Leadership student, at the Graduate School of Business and Leadership, of the University of KwaZulu-Natal. You are invited to participate in a research project entitled: **“Embracing Changes in Technology: A Case Study of the University of KwaZulu-Natal Libraries.”**

The aim of this study is to determine if UKZN Libraries’ electronic information accessibility is in par with the current trend in academic library sector as part of ensuring the university becomes the premier university of African scholarship.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this interview. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN.

If you have any questions or concerns about participating in the interview or about participating in this study, you may contact me or my supervisor at the numbers listed above. The interview should take about 45 minutes to an hour. I hope you will take the time to participate.

Sincerely

Investigator’s signature _____ Date _____

This page is to be retained by the participant

APPENDIX 1b: INFORMED CONSENT LETTER

**UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP**

**Master of Commerce in Leadership Studies Research Project
Researcher: Nokuthula Ndlovu (0312607015)
Supervisor: Cecile Gerwel Proches (0312608318)
Research Office: Ms P Ximba (0312603587)**

CONSENT

I..... (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

I hereby consent/do not consent to record the interview.

SIGNATURE OF PARTICIPANT:

.....

DATE:

.....

APPENDIX 2: INTERVIEW SCHEDULE

UNIVERSITY OF KWAZULU-NATAL GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

Masters Research Project

Researcher: Nokuthula Ndlovu (0312607015)

Supervisor: Cecile Gerwel Proches (0312608318)

Research Office: Ms P Ximba (0312603587)

Embracing Changes in Technology: A Case Study of the University of KwaZulu-Natal Libraries

Interview Questions

- Which Campus are you working for?
- What is your position in this institution?
- How can UKZN libraries adapt to technological changes so to contribute to teaching and research?
- What changes are required to make the UKZN libraries more competitive?
- Do you think UKZN Libraries are user-friendly?
- What technologies do you think users of UKZN Libraries will appreciate?
- What measures should be put in place for staff to embrace technological advancements?
- How can library staff be capacitated to embrace change in technology?
- What are potential areas of resistance to change that may be experienced in implementing technological changes in the UKZN libraries?
- What strategies can be identified to facilitate change in technology in the UKZN libraries?

APPENDIX 3: ETHICAL LETTER



21 June 2016

Ms Nokuthula Ndlovu (212561343)
Graduate School of Business & Leadership
Westville Campus

Dear Ms Ndlovu,

Protocol reference number: H55/0879/016M

Project title: Embracing changes in Technology: A case study of the University of KwaZulu-Natal Libraries

Full Approval – Expedited Application

With regards to your application received on 15 June 2016. The documents submitted have been accepted by the Humanities & Social Sciences Research Ethics Committee and FULL APPROVAL for the protocol has been granted.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully


Dr Shenika Singh (Chair)

/ms

Cc Supervisor: Dr Cecile Gerweil Proches
Cc Academic Leader Research: Dr Muhammad Hoque
Cc School Administrator: Ms Eileen Mohamed

Humanities & Social Sciences Research Ethics Committee

Dr Shenika Singh (Chair)

Westville Campus, Govan Mbeki Building

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Telephone: +27 (0) 31 260 3550/4557 Facsimile: +27 (0) 31 260 4006 Email: shsrap@ukzn.ac.za / shsrm@ukzn.ac.za / shsuno@ukzn.ac.za

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APPENDIX 4: LANGUAGE EDITING CERTIFICATE

G and S Robinson
10 Westcliffe Avenue
Westville
3629
5 February 2018

Ms N. Ndlovu
UKZN, Westville Campus

Dear Ms Ndlovu,

Editing Services

Thank you for the opportunity to edit your Master's dissertation:

Embracing Changes in Technology: A Case Study of the University of KwaZulu-Natal Libraries

We are pleased to advise you that we have completed the necessary editing work on your thesis in preparation for submission. We confirm that the English language usage is of an acceptable academic standard.

Should you have any queries, or require us to do any further work, please do not hesitate to contact us.

Yours sincerely,

Gail and Shaun Robinson

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APPENDIX 5: TURNITIN REPORT

Masters final Draft 2			
ORIGINALITY REPORT			
2%	1%	1%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS
PRIMARY SOURCES			
1	Submitted to University of KwaZulu-Natal Student Paper		1%
2	Jantz, R.C.. "Innovation in academic libraries: An analysis of university librarians' perspectives", Library and Information Science Research, 201201 Publication		<1%
3	Submitted to University of Southern California Student Paper		<1%
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6	sajlis.journals.ac.za Internet Source		<1%
7	Library Management, Volume 34, Issue 1-2 (2013-01-12) Publication		<1%
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