UNIVERSITEIT VAN PRETORIA
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THE USE OF MOBILE TECHNOLOGIES FOR SOCIAL MEDIA-BASED SERVICE DELIVERY AT MUNI UNIVERSITY LIBRARY, UGANDA

Mini-Dissertation

By

Bosco Apparatus Buruga
(U04810393)

Submitted in partial fulfilment of the requirements for the degree of

MASTER OF INFORMATION TECHNOLOGY

in the

SCHOOL OF INFORMATION TECHNOLOGY

of the

FACULTY OF ENGINEERING, BUILT ENVIROMENT AND INFORMATION TECHNOLOGY

UNIVERSITY OF PRETORIA

December 2016

Supervisors: Dr. C. Penzhorn
Dr. M. Holmner

DECLARATION

I hereby declare that this mini-dissertation is my original work and has not been presented for a ward of a degree in any institution or university. All sources and materials cited in this research have been acknowledged.

DEDICATION

This mini-dissertation is dedicated to my dear mother, Martha Amaniyo, and my wife, Irene Diria, who missed me; we had little time of interaction during the last two years of my studies.

ACKNOWLEDGEMENT

Glory be to God, how sweet is your name. I thank you God for your favour, provisions and blessings. I am grateful to the following:

Dr Cecilia Penzhorn and Dr Marlene Holmner, my study leaders, a *Big Thank You* for; your attentiveness and constructive comments that contributed to the success of my studies. You two are a great team. I enjoyed working with you;

The Carnegie Corporation of New York and University of Pretoria, for making it possible for me to enrol in this scholarship programme;

Muni University, for the permission granted to me to pursue my studies and to use the University Library as a case study for my research. I thank the staff of the University Library, who took interest in my research topic and encouraged me throughout my studies, as well as participated as respondents in my research;

The African Development Bank Higher Education Science and Technology (HEST) Project, for the financial assistance towards my research;

My brothers and sisters, for understanding my busy schedules and giving me the support and time that I needed to concentrate on my studies;

Professor Christine Dranzoa, for your support and always enquiring after the progress of my studies;

Finally, a *Big Thank You* to Dr Alfred Alumai, for editing this mini-dissertation.

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LIST OF ABBREVIATIONS

3G	Third Generations
4G	Fourth Generations
HEST	Higher Education Science and Technology
IM	Instant Messaging
ITU	International Telecommunications Union
MOPAC	Mobile Online Public Access Catalogue
MTN	Mobile Telecommunication Network
PDA	Personal Digital Assistant
RSS	Real Simple Syndication
SMS	Short Message Service
UCC	Uganda Communication Commission
UNISA	University of South Africa

ABSTRACT

This study aimed to understand how Muni University Library can effectively use mobile technologies to deliver social media-based library services. Data was collected from 100 undergraduate students and 4 members of staff of the University Library on the use of mobile and social media technologies for provision of library services and resources using self-administered questionnaires and face-to-face interviews, respectively. Only 88 student questionnaires were returned while all 4 members of staff participated in the face-to-face interviews.

The results show that the majority (96.6 per cent) of the students own mobile devices and social media accounts that are used for both academic and personal purposes. There is convergence in responses among students and staff that mobile and social media technologies are crucial for provision of library services and resources in the 21st Century. They suggest that these technologies be used in the Muni University Library to access subject guides, MOPAC, mobile website, library map, and e-resources, and reference services. Also, the results show that the Muni University Library is already providing services to its users through mobile technologies and social media using WhatsApp, Facebook, and Kindle Fires e-readers.

However, this study identified challenges that hinder the use of mobile and social media technologies, including unreliable internet connectivity, lack of a member of staff of the library responsible for managing technologies, lack of adequate skills among users and library staff required to use social media technologies, and lack of an independent library social media strategy. Discussion of the results and recommendations are presented in this mini-dissertation.

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CHAPTER ONE

INTRODUCTION AND OVERVIEW

1.1 Introduction

The advancement in technology and globalization has changed people's lifestyle and expectations as many prefer real-time communication and access to information irrespective of their location (Xu, et al., 2014:22). The development of social media tools and their access via mobile delivery platforms offers free tools and inexpensive conversations via text, video, voice chat, picture sharing, improved networking, collaborations, learning, and connections (Baggett and Williams, 2012; Gikas and Grant, 2013:18; Xu, et al., 2014:22).

In order to be relevant both locally and internationally, the founders of Muni University (Task Force) resolved in 2010 that Information and Communication Technology (ICT) will be the driving force in provision of library and information services to the university community (Muni University Strategic Plan, 2010). Similarly, the University Senate adopted blended learning as the approach for teaching and learning, and also passed a resolution that every student that joins the university comes with a mobile device as a tool to enhance their learning (Muni University, 2015).

The university adopted the practice of Bring Your Own Device (BYOD), which is a practice of students bringing their own devices with them to class (Brown and Pallitt, 2015:2). This is because Muni University is located in a rural part of Uganda with irregular supply of electricity (Muni University, 2010). Mobile devices like laptops and tablets are suitable for this environment in which the library has to operate as their batteries can save power for long periods of time.

Muni University Library envisages to be reliant on ICT in provision of services and resources, thus the Library's vision is to *"be a model library in provision of quality and ICT based information for teaching, learning and research of Muni University"* (Muni University Library, 2015). The library will achieve this vision by adopting technologies that will make information resources accessible to the university community in an efficient and effective manner, as well as establishing, promoting and maintaining a wide range of services that will support teaching, learning and research in the university (Muni University Library, 2015).

To support blended learning and to address some of the challenges affecting delivery of m-learning and e-learning in rural settings, the Muni University library acquired fifty (50) Kindle Fire e-readers to supplement the devices that students have access to. The Kindle Fires are smart tablet devices that have at least 7 hours battery power retention for reading, at least 8 GB of internal storage and powerful apps. In addition, the devices have fast web browsing, access to email, and calendar for users to program their activities (http://www.amazon.com/). Electronic library resources and lecture notes from the Learning System [Moodle] are downloaded on these devices (Muni University Library, 2015). With these devices, Muni University students now have unlimited access to the library anytime and anywhere.

The acquisition of these devices, the implementation of social media particularly Facebook, the development of a library website, and the installation of wireless access points in the library is tied to the mission and vision of the library. These technologies were adopted in order to provide wide access to information, solicit feedback from users, encourage collaborative learning, and promote library services anywhere and anytime, within and outside the university campus.

However, the Muni University Library Facebook account is not fully utilised as well as not popular as compared to the students own Facebook pages and profiles. Similar studies on use of social media tools by librarians at Copper Belt University, University of Zambia, and Mulungushi University in Zambia (Benda 2011), and another by Baro, Idiodi, and Godfrey (2013:182) about librarians' awareness and use of Web 2.0 tools in university libraries in Nigeria, found that librarians use social media tools for work-related tasks less frequently. The study also found that many librarians were constrained in using social media due to lack of skills and time.

In addition to the mushrooming social media tools, there has been a rapid increase in the ownership and adoption of mobile technologies (Chang, 2013:478). The improvements in technology as well as competition in the mobile telecommunication have tremendously reduced the cost of connectivity and increased the speed of data transmission, which have in-turn increased the penetration of broadband and ownership of mobile devices (Vassilakaki, 2014: 176). Mobile devices are now used all over the world for voice calls, reading e-books,

accessing learning content, sharing pictures, audio, and videos through social networking (Bridges et al., 2010). For instance, Anderson (2015) and Zickuhr and Rainie (2014) cited an exponential increase in ownership of smartphones by Americans from 35% in 2011 to 64% in 2015.

Similar reports in Africa also indicate increased ownership of these devices. It is reported that mobile penetration in most African countries has outpaced the income growth of most households (Gallup, 2015). The report suggests that in 23 Sub-Saharan countries at least 65% of households own mobile phones in 2013 and it is also estimated that 346 million Sub-Saharan Africans will own mobile phones by 2017. In Uganda, the Daily Monitor reported that 52.3% of Ugandans own mobile phones (The Daily Monitor, 2015).

Mobile devices offer a better alternative of delivering learning content and platforms for interaction with instructors and contemporary learners who prefer to access information quickly both in the classroom and off-campus through blended learning (Gikas and Grant, 2013:18; Okello-Obura and Ssekitto, 2015:1). However, observations at Muni University indicate that most students use their smartphones to make and receive calls, as well as listen and play music.

Therefore, this study aims to lay strategies and action plans that will lead to improved use of mobile technologies for social media-based library services. The intention is to improve the way in which social media and mobile technologies can be used to access library services at the Muni University Library and other academic libraries in the world. Furthermore, this study will increase awareness among the Muni University Community regarding the potential for mobile technologies.

1.2 Research Question and Sub-Questions

1.2.1 Research Question

How can the Muni University Library use mobile technologies for improved social media-based library services?

1.2.2 Sub-Questions

1. What are the practical applications of mobile technologies and social media in libraries?
2. What are the library user's perceptions towards use of mobile technologies for accessing social media library services?
3. What are the possible barriers that are central to effective use of mobile technologies for social media-based library services?
4. What are the strategies for effective utilisation of social media for accessing library services?

1.3 Scope and Limitations

The focus of the study was on how Muni University Library can effectively use mobile technologies for social media-based library services. Mobile technologies such as smartphones, tablets, laptops and social media tools such as Facebook, Twitter, WhatsApp and Skype are commonly used by Muni University Library users. This implies that these technologies could be effective in delivering library services because of their popularity if awareness is created. The study targeted undergraduate students and members of staff of the Muni University.

A major limitation of this study is that there is no stand-alone social media strategy and policy for the university and library in particular. This is because operationalisation of these technologies needs guidelines and experts to promote their use. Another limitation is that as technology evolves, it brings a lot of uncertainty. Therefore, it is envisaged that technological solutions, recommendations and conclusions proposed in this study will be valid for only a limited period.

1.4 Research Methodology

This study used a qualitative research method, which is research dependent on "empirical evidence" Kumar (2014:379). Kumar further, describes it as study that stresses "description and narration of feelings, perceptions and experiences rather than their measurement, and communicates findings in an analytical and aggregate manner, drawing conclusions and

inferences that can be generalised". This method was chosen because the focus of the study was on understanding the perception of library users towards use of mobile technologies for accessing social media library services, and also how social media tools could be used effectively for delivering library services. Detailed discussion of the research methodology used in this research is presented in Chapter three.

1.4.1 Population and Sampling

The target population was the undergraduate students and members of staff of Muni University. This population constituted hundred (100) registered students during academic year 2015/2016 (Muni University, 2016b: 32) and four (4) members of staff of the University Library. Convenience sampling, a form of non-probability sampling was used in this study. Convenience sampling according to Kumar (2014:368) is a sampling design in which respondents who are easily accessible within a geographical proximity are selected.

1.4.2 Data Collection

Two data collection methods were used in this study. Structured, self-administered questionnaires with both open-ended and closed-ended questions were used for collecting data from the students. This was chosen because it was a suitable method for collecting data from a large population in a short period of time and also reduces bias (Kombo and Tromp, 2006:89).

Semi-structured interviews were conducted with members of staff of the University Library to understand their views on use of mobile technologies and social media as a means of extending library services. The choice for conducting interviews with library staff was based of the small size of their population.

1.4.3 Data Analysis and Presentation

The data from closed-ended questions were coded and analysed using Microsoft Excel while those from open-ended questions were classified according to themes developed to group all similar responses to questions. The sub-divisions created in the data collection instruments were used for the interpretation of the data. The qualitative data obtained from the

respondents were classified according to the themes which were developed based on the questions asked in the questionnaire. Data analysis and presentation is further discussed in Chapter Three.

1.5 Value of the Study

This study provided insight into the use of mobile technologies and social media as a means of improving library services. While many studies have been carried out regarding mobile technologies and social media, this study focused specifically on the use of mobile technologies for social media-based library services at Muni University. The university was struggling with how to effectively use its social media accounts and pages, as well as Kindle Fires to effectively deliver library services. This study has made useful recommendations that other academic libraries and information professionals can apply at their respective institutions can adopt to use mobile technologies for improving library services.

1.6 Clarification of Terms

This section provides meaning to frequently used words throughout this mini-dissertation for ease of understanding by readers. These include the following:

Mobile devices: This refers to personal computing devices used for accessing electronic information both online and offline, characterised by portability, wireless connectivity, and smart (touch) screen. These include smartphones, laptops, tablets, e-book readers (e.g. Kindle Fires), calculators (Aguilar and Puga, 2015: 178; Gikas and Grant, 2013:19).

Mobile technologies: These are technologies that enable access and sharing (transmission) of electronic content (e.g. voice, text and video) by devices via wireless connections (Neupane, 2012: 25).

Mobile website: This is a website developed to be accessed by mobile devices (Neupane, 2012: 27). All the features of the website remain unaltered as the website content adjusts automatically to fit the size of the device screen used for accessing the site (Johnson, et al. 2015: 18).

Mobile libraries: These are facilities and services that are used by libraries to deliver information and learning materials accessed by mobile devices (Neupane, 2012:31). Some of these services and facilities include; developing mobile websites, library applications, Mobile Online Public Catalogue, use of QR codes, chat with librarian using IM platforms such as WhatsApp and providing e-book readers loaded with learning content. In the context of this study, mobile library does not mean a library in a van/truck that is mobile.

Social media: This is the use of a set of tools and technologies used for socialising and networking online with customers of a business or friends by use of text messages, images, audio and videos (Safko, 2012: 5; Reuben, 2008:1). These tools and technologies include Facebook, Twitter, LinkedIn, Blogs, WhatsApp, Pinterest, YouTube, Del.icio.us, Skype, Academia.edu and others.

1.7 Division of Chapters

This mini-dissertation is divided into five chapters. The detailed overview is as follows:

1.7.1 Chapter 1: Introduction

This is an introductory chapter that comprises background information about the study, research question and sub-questions, scope and limitations, justification for the study, overview of the literature; research methodology; value of the study; clarification of operational terms, and an outline of the chapters covered by this mini-dissertation.

1.7.2 Chapter 2: Literature Review

It discusses a review of literature on social media and mobile technology applications in academic libraries, internet penetration, use of mobile technologies for learning, mobile technologies and social media opportunities and challenges for libraries, mobile initiatives, mobile resources, and services already implemented by libraries.

1.7.3 Chapter 3: Research Methodology

This chapter provides a detailed description of the research methodology and design used in the study. It focuses on research design, data collection and analysis, sampling methods, data collection methods, and selection of the study location.

1.7.4 Chapter 4: Data Analysis and Research Findings

This chapter foour focuses data analysis and reports the research findings, and provides discussions and interpretations of the findings.

1.7.5 Chapter 5: Recommendations and Conclusions

This chapter provides a summary of the study's recommendations and conclusions.

1.8 Conclusion

This chapter provided introduction and background for the study, presented the research question and sub-questions, stated the justification for the study. Additionally, discussions for the value and limitations of the study were presented, and what will be deliberated in other chapters. The immediate chapter discusses the related literature for the purpose of this study specifically on; use of mobile technologies for teaching and learning in higher education, the support role the academic library can provide in the use of mobile technologies for teaching, followed by a discussion on mobile technology initiatives in libraries and the practical usage of social media in libraries.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The advancement in mobile technologies has changed people's way of communication and access to information (Li, 2013:223). The rapid developments in handheld mobile computing devices have prompted academic libraries and librarians worldwide to leverage the power in these devices to access information anytime and anywhere (Krishnan, 2011:40).

The impact of mobile technologies and social media in contemporary society cannot be taken for granted by any organisation. For example, Sean Coughlan, the Education correspondent for BBC World service quoting the Childwise Monitor report 2016, reported that younger population interests changed from watching TV to spending more time socialising online. According to Coughlan (2016) 60 percent of the respondents to the Childwise Monitor report indicated that they enjoy watching TV on their mobile phones or tablets and laptops because of the freedom to select content of their choice (Coughlan, 2016).

This chapter focuses on exiting literature such as books, journals and dissertations that have a bearing on the study being conducted (Kombo and Tromp, 2006:63). It further emphasizes the use of mobile technologies for teaching and learning in higher education, and discusses reasons why mobile technologies are useful for Africa. Furthermore, attention is given to the role the academic library can provide in the use of mobile technologies for teaching. This is followed by a discussion on mobile technology initiatives in libraries and the practical use of social media in libraries. The chapter is concluded by discussing the opportunities, challenges and strategies for implementing mobile technologies and social media in academic libraries.

2.2 The Use of Mobile Technologies in Education

2.2.1 Introduction

Due to the constant challenges facing the education sector world over, universities have adapted technology to combine both "e-learning and face-to-face (F2F) delivery" of teaching

and learning as an alternative to the traditional physical classroom teaching and learning method (Nambale, 2014:87). The ever increasing enrolments, the demand for higher education coupled with the limited physically learning spaces, limited funding opportunities and few highly qualified academics in higher learning institutions, both new and old, have forced many to adapt to technology-mediated education through blended learning (Nambale, 2014:87). For instance, a study conducted Foko (2009) found that 97.3 percent of the 74 university students who participated in the survey had mobile phones, and used them for basic functions such as making and receiving calls and for Short Message Service (SMS) (Foko, 2009). He concluded that mobile phones were suitable for learning because of their powerful computing power similar to the functions performed by some desktop computers.

Similarly, a study conducted by Jantjies and Joy (2015) on M-Thoto found evidence that the use of smartphones in learning among high school learners in both rural and urban South African schools contributes to effective learning by providing access to digital learning resources to students at their convenience (Jantjies and Joy, 2015: 309). Jantjies and Joy (2015: 309) defined M-Thoto as a bilingual mobile learning application accessible by mobile devices such as smartphones and tablets.

These technologies offer additional opportunities for students in higher learning institutions to access learning contents (Gikas and Grant, 2013:18). Mobile devices are highly relevant to higher education because they promote hands-on learning and engagement through the interactivity of using mobile applications. This approach is useful for universities that are promoting long life learning (Foti and Mendez, 2014: 61). Some institutions in Africa and Uganda in particular that have adopted mobile technologies are already benefiting from these technologies.

2.2.2 Why Mobile Technologies for Teaching and Learning in Africa?

There has been huge improvements in cellular communication, internet connectivity and increase in ownership of mobile telephone in Africa (ITU, 2015; Mtebe and Raisamo, 2013:4; Tagoe and Abakah, 2014:99). Caperon (2015) and Tagoe and Abakah (2014: 99) are of the opinion that contemporary students in higher education prefer accessing educational information on their mobile devices because it is quick and efficient. Higher education institutions of learning, including academics libraries, have taken advantage of the numerous

benefits offered by mobile technologies and social media to provide alternatives for teaching, learning and delivering educational content (Nambale, 2014:89; Okello-Obura and Ssekitto, 2015:19).

However, on the negative side, despite this high penetration rate, many institutions in East African have not yet taken advantage of this technology for teaching and learning as an alternative. Few institutions with e-learning programmes are running them on desktop computers that are not convenient for those who prefer flexible and mobile learning (Mtebe and Raisamo, 2013:4).

Historically, in East Africa the first use of mobile technologies through mobile phone for learning was reported to have been implemented in Kenya through a project sphere headed by the University of Wolverhampton with the aim of developing a bulk Short Message Service (SMS) system that would be used to distribute learning content and other study material (Traxler, 2006:94). The project recommended the adoption of bulk SMS for learning because the initial capital investment was negligible as compared to building ICT infrastructure. Mobile learning was important in Kenya at the time of that study because it minimised the limitations of physically accessing the learning institutions due to poor roads and communication infrastructure, as well as poor electricity supply (Traxler, 2006:95).

The mobility of mobile devices promotes learning at any location without geographical limitation and at any time that is appropriate to the learner unlike in the traditional methods of teaching and learning where the learner is fixed in a physical space (Hlagala, 2015: 26) attracted some institutions to adopt mobile learning to address some of the challenges facing traditional learning systems reported by Traxler (2006:95).

Some universities in Africa have started initiatives of encouraging students to own mobile devices voluntarily or through compulsory means. For instance, in South Africa, Brown and Pallitt (2015:4) stated that the University of Cape Town (UCT) introduced mandatory one-to-one laptop access through the Flexible Learning Pilot Project whereby students under the financial aid were given laptops by the university, while the University of Johannesburg (UJ) provided all first-year students in 2014 funding through the National Students' Financial Aid Scheme to acquire mobile devices for learning and also the Sol Plaatje University in the Northern Cape in a similar way sponsored 110 first year students from four study programs at

the university with laptops. This was done to increase one-to-one access to these devices (Brown and Pallitt, 2015:4).

In Uganda, in the last five years certain universities including Livingstone International University, International University of East Africa, Uganda Technology and Management University, and Victoria University provide first year students with mobile devices such as Kindle Fires and laptops loaded with learning materials (Nambale, 2014:89). Muni University right from the onset opted to make full use of technology as part of its blended learning approach towards teaching and learning.

The Muni University Senate, having recognised the possible benefits of using mobile devices to augment learning, made the resolution that mobile devices be integrated into the registration requirements for every student that joins the university (Muni University, 2015). Due to the likely challenges of managing the use of these devices coupled with the complex public procurement laws and regulations, the university adopted the practice of Bring Your Own Device (BYOD). Brown and Pallitt (2015:2) defined BYOD as the practice of students bringing their own devices with them to class.

Lecturers and instructors play a big role in the promotion of mobile learning, according to Brown and Pallitt (2015:5) instead of lecturers viewing mobile devices as distractors to learning by students, they should instead encourage students to use them as learning tools and design course activities and assignments that require application of these devices. Similarly, Hlagala (2015:12) and Wang et al. (2009) cited in Mtebe and Raisamo (2013:15), recommended that the following should be done:

a) Instructors should make it a priority to identify quality learning materials that are usable by various mobile devices and also that can attract the learner to continue reading and avoid common allure of social media;
b) Development of mobile applications targeting the different mobile phone operating systems;
c) Development of content for the African continent that is characterised with multiple languages;
d) The slow internet connectivity need to be handled since most of mobile learning content is accessed online.

e) The negative perceptions that the mobile device screen breaks easily and batteries are weak and do not last for long and also accessing learning content from textbooks is easier than from the mobile devices need to be erased from learners' minds so that they can leverage the benefits of mobile learning.

Academic libraries as key partners of teaching and learning at higher education institutions are not spared from these transformations. According to Vollmer (2012:3) some academic libraries have adopted mobile technologies as an alternative to extend their services and resources to their patrons who prefer using mobile technologies for learning and accessing academic information at any place and time of their choice. The next section discusses how academic libraries are supporting mobile teaching and learning in higher institutions of learning.

2.2.3 Academic Libraries Can Support Mobile Teaching and Learning

Studies have shown that mobile technologies are useful for accessing study materials faster in efficient ways and also facilitating communication and collaboration by students with their classmates and teachers at lower costs (Mtebe and Raisamo, 2013:15; Hlagala, 2015:12; Gikas and Grant, 2013:19; Bozalek, 2011: 157 and Parr, 2013). However, the success of the use of these technologies for learning is challenged with low battery power retention of some of the mobile devices and poor internet connectivity (Chuene, Lepota, and Hans, 2014: 299; Song and Lee, 2012:580).

Muni University has adopted technologies that are suitable to its environment (i.e. irregular electricity supply and unreliable internet connectivity) (Muni University, 2010). The academic library acquired fifty (50) Kindle Fire e-readers to support the blended learning approach and to address some of the challenges affecting delivery of mobile and e-learning in rural settings. The Kindle Fire has long battery power retention of up to 7 hours of reading, internal storage of at least 8 GB, powerful apps, fast web browsing, email, and a calendar for users to program their activities (http://www.amazon.com/).

The academic library's introduction of Kindle Fires has made the library a valuable and admirable partner in the implementation of the university's blended learning approach. As a result, Muni University students have unlimited access to the library at any time and from

anywhere with their tablets or kindles loaded with electronic library resources and lecture notes from a learning system (Moodle) (Muni University Library, 2015). Thus, academic libraries can play a vital role in ensuring that mobile technologies are utilised as channels for teaching and learning by providing content and offering training (De Wee, 2013:47).

2.3 Mobile Technologies in Academic Libraries

2.3.1 Introduction

Mobile devices have revolutionised the way people access information from any part of the world (Negi, 2014:14). The growth in the ownership of the mobile device can be attributed to reduced cost of mobile devices due to competition caused by telecommunication companies, rapid technological changes in mobile devices, and low-cost connectivity (Vassilakaki, 2014:176). These mobile devices have infiltrated all sectors of society including the education sector. As such, many people can get access to the internet from mobile devices, changing the way they communicate, search and retrieve information in the process changed. Many prefer accessing information from anywhere and at any time through these mobile devices (De Wee, 2013:20; Vassilakaki: 2014:176).

As mentioned previously, mobile technologies offer people alternative ways of accessing digital information (Burford and Park, 2014:622). This has drawn the attention of librarians as to how they can utilise the available opportunities provided by mobile technologies to deliver traditional library services (Lombardo et al., 2012:15). Numerous studies point to the fact that mobile technologies have become popular in libraries (for example, Malathy and Kantha, 2013; Krishnan, 2011; Negi, 2014; Vassilakaki, 2014; Lombardo et al., 2012; Kumar, 2014; Elahi and Islam, 2014, Gikas and Grant, 2013). For example, Kumar (2014: 475) investigated student opinion regarding the use and success of mobile technology by libraries, and found that “the technology has relevance to libraries in enhancing the quality of their services and to connect with their patrons […] students are ready to have web-enabled mobile phones if the library starts mobile technology for providing services” (Kumar, 2014: 475).

Findings of the study by Kumar (2014) manifest that a large number of students prefer their libraries to interact and provide services to them through mobile means. The push factor for

such demand by library users according to Elahi and Islam (2014) is the desire to access online information at any place without geographical limitation as is the case with desktop computers and traditional physical libraries (Elahi and Islam, 2014). The increase in the ownership of mobile devices have not been ignored by some libraries specifically those that have continued to innovate and tap the opportunities offered by the new technologies that have infiltrated our society. This has made them offer services relevant for their patrons (Caperon, 2015).

In order to keep pace with these evolving technologies contemporary libraries and librarians are using social media and mobile technologies as enablers for providing library resources and services with the aim of reducing time spent and barriers in accessing the library (Caperon, 2015; Malathy and Kantha, 2013:361; Krishnan, 2011:8). Some of the commonly used mobile devices by library users are discussed in the following section.

2.3.2 Mobile Devices

Valk et al. (2010) and Gikas and Grant (2013:19) define mobile devices as mobile computing devices including technologies that are transportable like cell phones and smartphones, tablet computers, laptops, and netbooks. These devices are manufactured with different capacities, capabilities, types, and models with the recently manufactured having touch screens, blue tooth and Wi-Fi, using either 3G and 4G technologies in accessing internet (Malathy and Kantha, 2013:362).

The development of cellular technology contributed greatly to the widespread access to digital information through mobile smartphones and social media (Safko, 2012: 458). He explained that these phones have capabilities of playing and downloading music, write and read emails and blogs, capture and share digital pictures and videos through social media and websites, and access maps among other services. Some libraries are circulating mobile devices to their users to access library services and resources. The following section discusses some of the more common mobile devices used within academic libraries.

2.3.2.1 Smartphone

A smartphone can be defined as a phone that uses wireless technology for accessing and surfing the internet and also possessing some similar functions to a desktop computer such as accessing and sending emails, playing music, and uploading content to the internet (Krishnan, 2011:8). Song and Lee (2012:578) added that such phones run on varying operating systems, for example, the iPhone uses Apple's iOS, Samsung and many other smartphone brands use Google's Android, Microsoft and recently Nokia phones uses Microsoft's Mobile Windows, while Blackberry phones use Research in Motion (RIM). Smartphones have become so popular in the education sector today and are owned by many students (Caperon, 2015). A survey at Leeds University Library between 2012 and 2014 found that 86% of the respondents, who owned smartphones indicated that they use their phones for renewing books, read online articles or books, check their library account, find library open hours, and search for catalogues.

2.3.2.2 Tablet Personal Computers

Tablets are described by Burford, & Park (2014:622) "[…] as lightweight, flat and portable computing technology that can be connected to the internet". They comprise a touchscreen, WI-FI capability, and storage capability for handling multimedia functions (Song and Lee, 2012:578). These devices became common around 2000 with Microsoft leading the market. However, they became popular in 2010 with the introduction and release Apple's iPad and Samsung's Galaxy Tab into the market (Song and Lee, 2012:578; Burford and Park, 2014:622).

In the education sector the mobile computing devices are evident. For example the study conducted by Song and Lee (2012:579) and Burford and Park (2014:629) found that students own both tablets and smartphones. They indicated that the tablets are preferred because of their wide display screen and faster access to the internet due to better connectivity capabilities. Searching for information on the tablet is preferred because it can be done in three ways – browsing, searching and using applications (Burford, & Park, 2014).

2.3.2.3 E-readers

An e-reader is defined as a handheld device characterised by being portable, having long battery power retention capability, adjustable screen resolution fit for reading digital content like e-books, online newspapers and others (Chuene, Lepota, and Hans, 2014: 299). These devices connect to the internet via wireless technology. The common examples of e-readers in education include Amazon's Kindle, Barnes and Noble's Nook and Sony Reader (Chuene et al., 2014: 299; Song and Lee, 2012:580). Some of these devices like the Amazon's Kindle have continued to be improved in capabilities and specifications similar to the ones of Tablet PCs. The common uses of these devices are to store and organise digital content downloaded from the internet (Song and Lee, 2012:580).

According to Chuene et al. (2014:299), e-readers are becoming popular because of the positive change in people's perception towards reading e-books, especially for leisure. However, it is proposed that issues of intellectual property, copyright and property rights, e-book piracy, and access limitations should be addressed by librarians so that the library users are not inconvenienced while accessing e-resources (Chuene et al., 2014: 301). The possible reasons for the change of attitude towards using e-readers and e-books according to Chuene et al., (2014: 303) include the following:

- Distribution: e-readers have capacity to carry or hold over 1,500 e-books reliving library users of the burden of carrying heavy textbooks while having access to many books to read;
- Text-to-speech: e-readers with text-to-speech audio capability are found to be valuable to people with visual impairment, challenges with "reading fluency" and "language barriers";
- Portability: library users don't worry about carrying heavy textbooks; they now enjoy carrying a small piece of hardware that contains Gigabits of files of e-books with less weight;
- Convenience: in the education sector, students' burden of going to bookstores to buy textbooks is reduced as they buy books online from Amazon and delivered to the e-reader instantly. No need to worry about which textbooks to carry to school from

places of residence, students carry their entire college reading materials for the year at once.

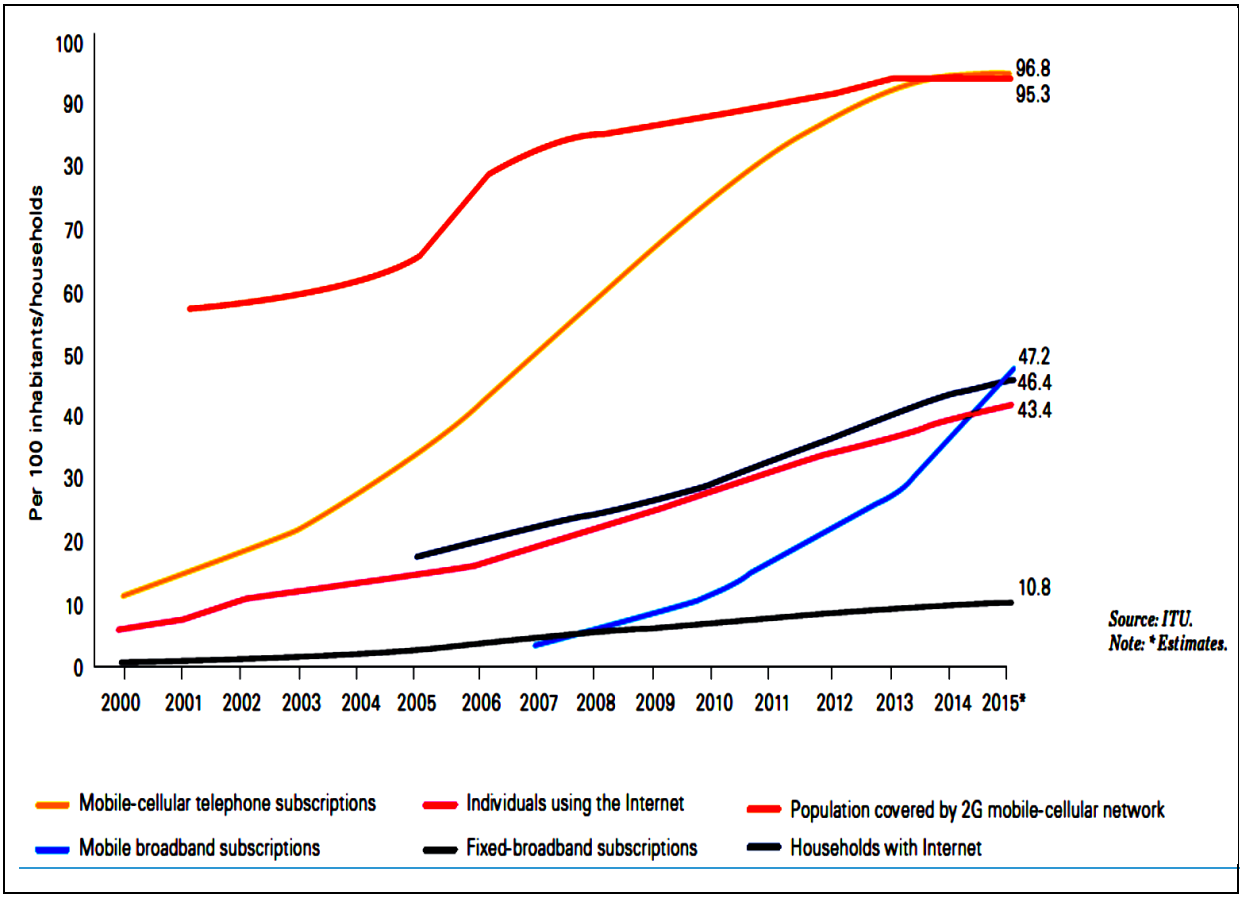
2.3.2.4 Laptops

A laptop is a portable and mobile computing devices preferred by many because of its large screen and keyboard that is often used for note-taking, and designing computer programs among other functions (Foti and Mendez, 2014:69). There is a rapid revolution in the laptop manufacturing industry; many of the laptops today have small, slim and light-weight with touchscreen capabilities and bigger storage capacities (Brown and Pallitt, 2015:5). Laptops have become powerful tools in the educational sector by enhancing learning as they are used for downloading online and storing information resources, supporting course designing activities and accessing e-learning platforms (Brown and Pallitt, 2015:4).

Now that there is a better understanding of the types of mobile devices, it is necessary to discuss mobile /cellular penetration as this enables these devices to connect to the internet. The next section discusses an overview of mobile penetration in Africa.

2.4 Overview of Mobile Penetration in Africa

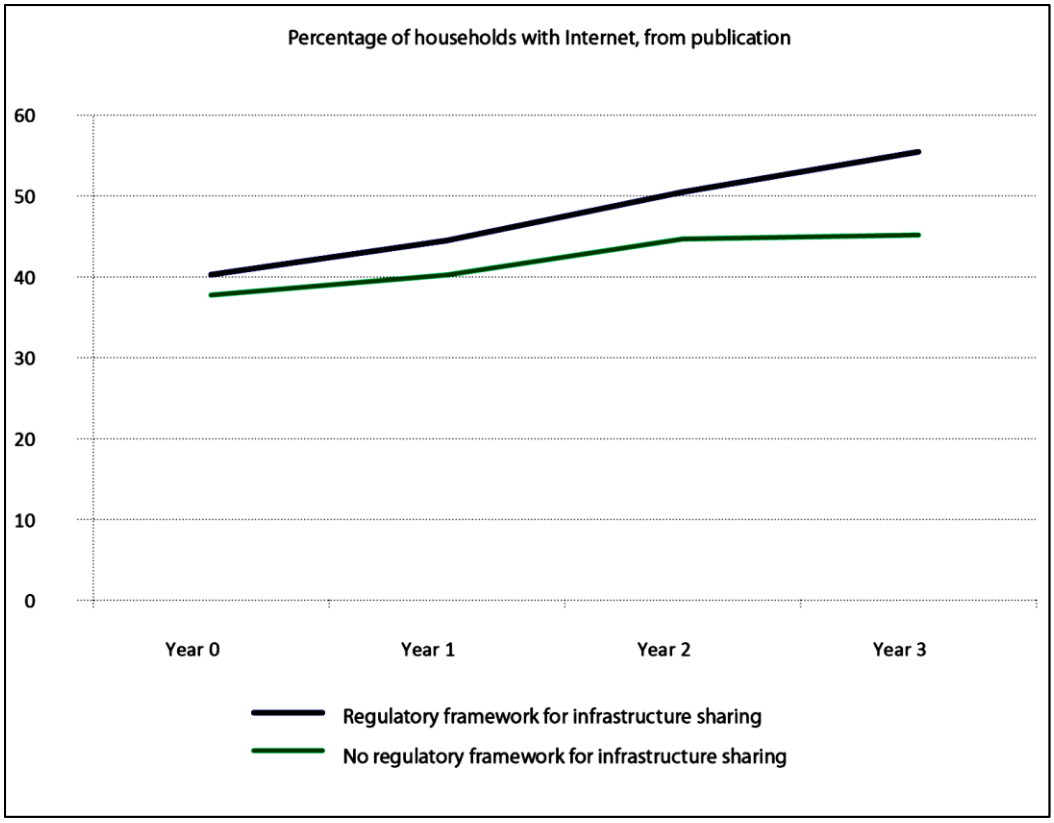
The global mobile cell phone market penetration has continued to increase exponentially. By the end of 2016, there were over 7.4 billion mobile cellular subscriptions worldwide, reflecting a 97 percent market penetration rate, an increase from the 738 million mobile phone subscribers in 2000 (ITU, 2016:16). Figure 2.1 provides graphical global mobile cellular subscriptions. Similarly, there is also a tremendous increase in internet penetration worldwide: it is projected that by the end of 2016 over 52% of households worldwide will be connected to the internet, which is an increase in the penetration rate of 3% from the 49% penetration rates of 2015 (ITU, 2016:42). Figure 2.2 provides an illustration of the global percentage of households with internet access.



Source: ITU ICT Facts & Figures, 2015

Figure 2.1: Global mobile cellular subscriptions

The ITU 2015 report further indicated that only 34% of the population in the developing world had access to the internet in 2015 as compared to over 80% in developed world. Africa statistics are still low with only 1 in 5 people using the Internet as compared to the 2 in 5 people in Asia and Pacific, and 3 in 5 people in the Commonwealth of Independent States (CIS). In Uganda mobile cellular subscriptions increased from 37.74 per 100 inhabitants in 2010 to 52.43 in 2014 per 100 inhabitants (ITU, 2015).

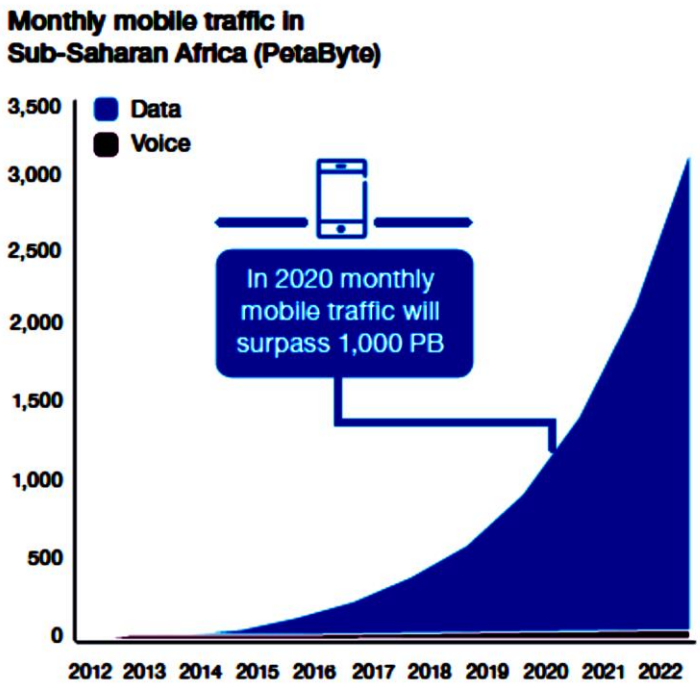


Source: ITU state of broadband, 2016

Figure 2.2: percentage of households with Internet access

Globally, mobile-broadband subscriptions increased from the 40% in 2013 to 48.8% in 2015, this figures are further expected to rise to 85% in 2020 (ITU, 2016). The number of mobile broadband subscriptions have continued to grow very fast in Africa, for example, the mobile-broadband penetration increased from the 11% in 2013 to 17.4% in 2015 (ITU, 2015).

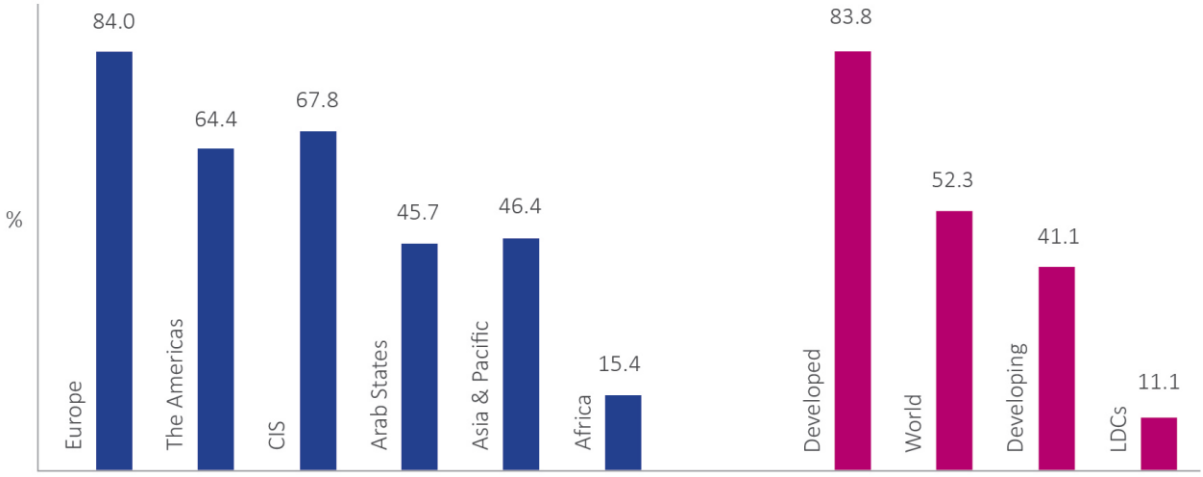
The latest Ericsson Mobility Report 2016 shows that mobile broadband in Sub-Saharan Africa has risen to 35 percent (Ericsson, 2016: 3). The Ericson Report further estimated an annual increase in broadband penetration rate of 15 percent between 2016 and 2022 for Sub-Saharan Africa (Ericsson, 2016: 3). According to the Cartesian 2015 report, gave individual country penetration estimates for year ending 2014 as; Kenya 38%, Nigeria 38% and South Africa with 48.9% (Cartesian, 2015). Mobile broadband has made access to the internet easy by both smartphones and even simple mobile phones (Pimmer and Tulenko, 2015:3). The Mobile traffic growth in sub-Saharan Africa has continued to grow exponentially; the Figure 2.3 provides graphical illustrations of Monthly mobile traffic in Sub-Saharan Africa.



Source: Ericsson Mobility Report 2016

Figure 2.3: Mobile traffic growth in Sub-Saharan Africa

In Uganda, mobile broadband increased from 2.6 million subscriptions in 2012 to 4.1 million in 2014, representing a penetration rate of 11.7 percent (Cartesian, 2015:8). The Cartesian further predicted that there will be over 26 million (49%) mobile subscriptions in Uganda in the year 2019, however, the report indicated that the mobile broadband subscription in Uganda would have grown faster than it is today due the poor electricity connectivity with only 14% of the population connected to the electricity grid mainly the urban population (Cartesian, 2015:11). Figure 2.4 and Figure 2.5 provides graphical representation of global broadband household penetration by region and mobile broadband penetration in Uganda, 2010-2014 respectively.



Source: ITU The state of Broadband, 2016

Figure 2.4: Broadband household penetration by region

Source: Cartesian- Broadband Internet Access, 2014

Figure 2.5: Mobile Broadband penetration in Uganda, 2010-2014

The increase in mobile internet and broadband coupled with the increased mobile phone and devices penetration opens up opportunity for the education sector specifically in transforming teaching and learning globally (Tagoe and Abakah, 2014:91).

In Africa, particularly East Africa, the increase in internet penetration is realised because of the recent connection of the region to the undersea cables at Dar-es-Salaam and Mombasa with the TEAMS and EASSy projects (Wangalwa, 2015; Muneja and Abungu, 2012; Schumann and Kende, 2013:4). Some of the other reasons postulated for this increased

penetration in Uganda are: the reduction of prices of mobile devices, expansion of mobile broadband projects, and Wi-Fi HotSpots for example in Uganda by MTN (Vutagwa, 2013; Muneja and Abungu, 2012; Okello-Obura and Ssekitto, 2015:19; Lazier, 2010:5).

The competition in mobile telecommunication is benefiting the consumers for example, in Uganda, MTN Uganda offers their mobile internet users 15MB of free data every month (Vutagwa, 2013). Academic libraries are taking advantage of the numerous benefits offered by mobile technologies. The next section discusses the mobile technologies used in libraries.

2.5 Mobile Resources and Services in Academic Libraries

The revolution in mobile technologies have contributed greatly to the change in library users' expectations especially on how to access information and library services (Johnson, et al. 2015: 18). The most popular activities that people do online with their mobile devices according to Safko (2012: 460) include web search, accessing online information, playing and downloading music and videos, chatting using instant messaging (IM), and e-mail. In order to thrive in mobile environment, libraries are loaning out mobile devices like tablets and e-readers as well as developing mobile friendly catalogues, database applications (apps), websites, library mobile applications containing information about library operation hours and locations, library instruction and mobile learning, Virtual reference and QR codes (Johnson, et al. 2015: 18; Pietersen, 2015:19, Negi, 2014:15; Karim, Darus and Hussin, 2006:39; De Wee, 2013:83).

Libraries are engaged in provision of mobile services to their users in order to leverage the benefits offered by the mobile devices and also enhance service provision to patrons. The next subsection will discuss examples of mobile services implemented in libraries.

2.5.1 Mobile Library Websites and Mobile Library Applications

A mobile website is one that is "responsive" meaning all the features of the website remain unaltered as the website content adjusts automatically to fit the device screen for accessing the site (Johnson, et al. 2015: 18). Converting the traditional library websites into mobile compliant interfaces involves optimisation, which is a process of editing the website by

removing images or adjusting resolutions of images and formatting the text (Bomhold, 2014:339).

Libraries and publishers have embarked on developing applications (apps) and mobile websites so that their clients can access library services and resources, both online and offline, at their convenience (Boruff and Storie, 2014:26).

Malathy and Kantha (2013) proposed that when developing library apps, special consideration should be taken for people with special needs. The app should incorporate speech technology so that the visually impaired may benefit from the developed app (Malathy and Kantha, 2013:362). In addition, De Wee (2013: 81) found that the non-use of library websites at the University of Pretoria by students was due to insufficient capabilities of some phones as well as lack of knowledge on how to access the mobile website. Burford and Park (2014:630) suggest that the apps that libraries adopt should be compatible with users' devices, trusted, reliable and benefit the users.

The University of Hong Kong Libraries, the Hong Kong Polytechnic University Library and University of Zimbabwe Libraries are using WhatsApp, a commercial app for communicating with library users, providing mobile-based Library Lending Services, News and Events, Notice and Suggest a Purchases, Image Services (Jharotia, n.d.). The University of Pretoria (UP) Library and University of South Africa (UNISA) Library developed library mobile websites and own library apps that are downloadable from the apps store. Figure 2.6 provides screenshots of library apps of University of Pretoria and University of South Africa Libraries.

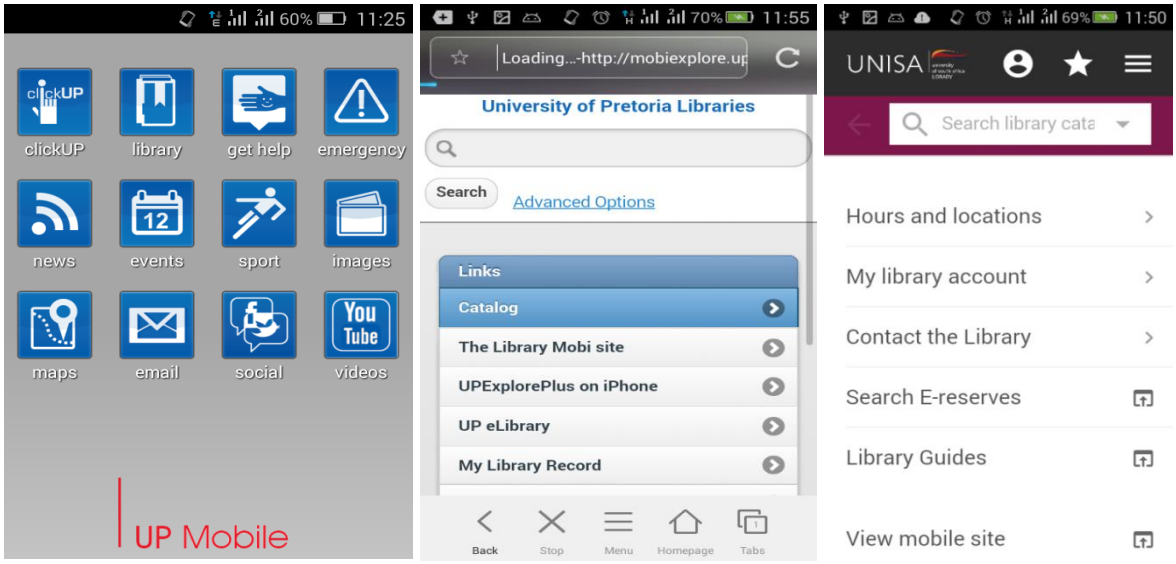


Figure 2.6: Screenshot of University of Pretoria and University of South Africa Library mobile apps

2.5.2 Library Mobile Catalogues

Due to the rising demand by library patrons to access library resources including library catalogue from the mobile devices, libraries have developed mobile catalogues commonly known as MOPAC (Mobile Online Public Catalogue) for searching and retrieving information from the catalogue, placing holds (Bomhold, 2014:341; Elahi and Islam, 2014; Kumar, 2014: 476). The OCLC, the developers of the integrated library management system called Millennium, introduced a catalogue application called AirPAC to serve their partners using the library system especially the mobile users (Cummings et al., 2010:34; Bridges et al., 2010:314). AirPAC only favours libraries that use Millennium and even has limitations and therefore, other libraries like the Oregon State University Libraries developed their MOPAC that was suitable to their specific needs (Bridges et al., 2010:314).

Whatever options the library chose to adopt in implementing MOPAC, whether supplied by the vendor or developed in-house, understanding the users' information searching behaviour must be prioritised. For example, the catalogue should allow multiple searching options and also a search box for searching by either Title, or Author, Date, Keyword, ISBN and others, but importantly it must (Paterson and Low, 2011:422). Availing library users MOPAC searching interface contributes greatly to the achievement of the patrons desire to access content and services from the library "when and where" they wish to (Johnson et al.,

2015:18). Some of these catalogues are now available on library applications (apps) (Negi, 2014:15). Figure 2.7 provides screenshots of library mobile catalogues of University of Pretoria and University of South Africa Libraries.

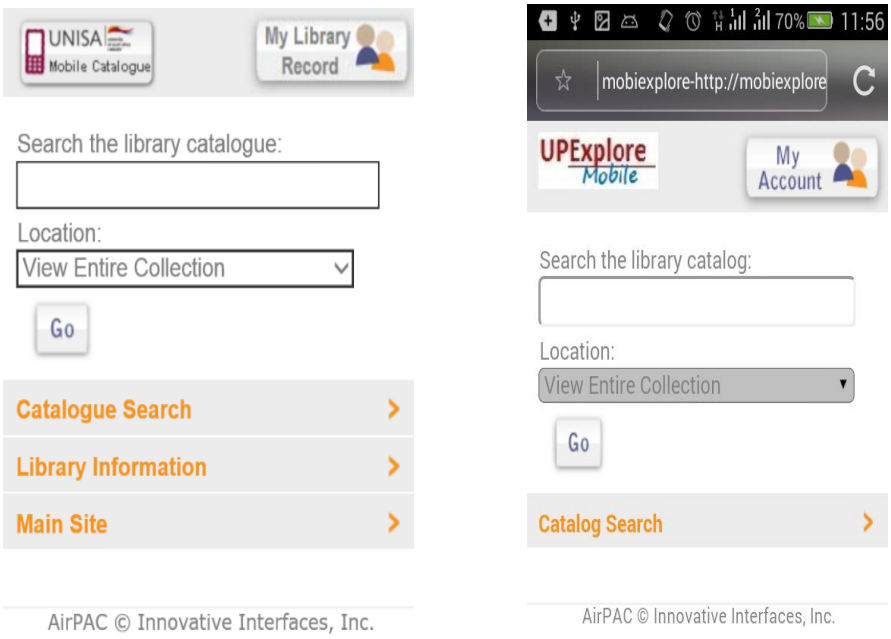


Figure 2.7: Screenshot of University of Pretoria and University of South Africa library mobile catalogues

2.5.3 Mobile Databases and E-Journals

Libraries and publishers are providing their clients with information sources and services in various formats and channels. One such channel for digital information is mobile applications (apps) for databases and e-journals. This is aimed at meeting the convenience of the users so that they access information in real time as they desire (Safko, 2012: 460). A study by Boruff and Storie (2014:22) found that 50.2 percent of respondents use their mobile devices to access articles from the journals and databases that their universities subscribe to.

With the mobile applications, libraries can share their digital content and services with their users. However, libraries will have to rely on the database and e-journal vendors for the mobile applications, Lie (2013:225) and Bomhold (2014:343) listed some vendors who supply academic software, databases, e-journals, and other mobile services. These vendors include the American Institute of Physics iResearch, Proquest, Web of Science, SciVerse, EBSCOhost Mobile, Encyclopaedia Britannica, Safari Books Online, IEEE XPlore, JSTOR,

Scopus, Westlaw, Taylor & Francis, and Summon. The library users are required to download, install and access information from the app by logging in with their accounts (De Wee, 2013:29).

2.5.4 Mobile Reference Services

This is a vital service that libraries offer to their patrons to help them access library services and resources. Libraries are today offering this service to their users through mobile technologies by the use of Short Message Service (SMS), live chat, and email (De Wee, 2013:31). Reference service is now not done only through face-to-face or through library website, but virtually as well (Malathy and Kantha, 2013:363).

Short Message Service (SMS) has become a powerful tool in the era of mobile devices (Safko, 2012: 460). Academic libraries are deploying this service to offer reference services such as issuing notices about new book acquisitions and subscribed e-resources, informing users about available reserved books, providing overdue notice, announcing change in library opening hours, and scheduling for library training (Malathy and Kantha, 2013:363).

Another example of a notification service is Ask-a-librarian, which is a reference tool that libraries are using to provide quick feedback to their users by employing email, phone call, text, and Instant Messaging (IM) tools (Bomhold, 2014; Li, 2013:225). Ask-a-Librarian is a very popular service in the US libraries. A study by Bomhold (2014:341) on mobile services at academic libraries found that 76.9 percent of the libraries use the service (Ask-a-librarian) for their library staff to answer users' queries.

The commonly used notification services are the platforms for IM services. Some of the tools and services used by libraries include Google Talk, Yahoo Messenger, America Online, AIM, Skype, LibraryH3lp, Meebo, MyInfoquest, and Shoutbomb (Boateng and Liu, 2014: 129; Malathy and Kantha, 2013:363). These tools have functions for live text chat and call for libraries to deploy both or one that fit them. However, technological infrastructure can dictate which service to use.

2.5.5 Information Literacy and Mobile Library Tours

Libraries have created podcasts and instructional videos to teach and train users to learn how to access information from databases and bookshelves (De Wee, 2013:31). The Southeast University Libraries in China developed help tutorials on MP3 and videos files that are distributed to the library users to learn how to access library services and resources (Li, 2013:225). It is reported by Li (2013) that the instructional resources became popular and vital for the library for extending library information literacy training or user education and library tours to library patrons who don't have time to attend on-site trainings.

Libraries have developed audio tours that can be accessed via mobile devices for library users to conduct self-tours of their libraries and library orientation. These virtual tours according to Malathy and Kantha (2013:364) attract non-regular library patrons. Malathy and Kantha added that virtual tours are vital for the library because their application in libraries saves staff time needed for orienting new users (Malathy and Kantha, 2013:364).

2.5.6 The Use of Quick Response Codes

Quick Response (QR) codes are two-dimensional patterned graphics that, when read by mobile devices, represent text and link to internet content (Whitchurch, 2011:14). This code was developed by DENSOWAVE in 1994 with the aim of reducing time and errors in typing while searching for information online (Krishnan, 2011:9; Lombardo et al., 2012:15). Users of these codes are required to download the QR code scanner/reader app which is available for most smartphones and tablets (Lombardo et al., 2012:15) The QR codes are so popular today that they are found on magazines, posters, and webpages (Pietersen, 2015:21).

In academic libraries, QR codes have become a convenient method for accessing information with use of mobile devices (Lombardo et al., 2012:15), promotion and marketing (Whitchurch, 2011:14). Other libraries use them to label books, posters, link to library OPAC, subject guides, bookmarks, e-journals and databases (Malathy and Kantha, 2013:364; Whitchurch, 2011:15). Figure 2.8 below is of QR code containing a link to the University of Pretoria Institutional Repository.

Figure 2.8: QR code for University of Pretoria Institutional Repository

The J. Willard Marriott Library at the University of Utah uses their QR codes for promoting Digital Collections (art collection). The images of the university taken during exhibitions, portraits of prominent university administrators, professors, and benefactors scanned and allocated suitable and relevant metadata before storage in the digital collection. Each item is given a QR code as a gateway for library users to get access to the items (Lombardo et al., 2012:18). The library also uses the tool for mobile class registration, where QR codes are linked to workshop registration forms. Quick Response codes are also used by the library for reserving group study rooms (Lombardo et al., 2012:18).

Krishnan (2011:9) and Lombardo et al. (2012:16) listed the following as the general application of QR codes in libraries:

- Share library contact information,
- Send emails and SMS,
- Share audio and video library instruction resources,
- Share library news through RSS and links to library catalogue records for specific subjects,
- Assisting library users and visitors to scan the code that locate direction of library building or act as library signage,
- Provide direct link for accessing library electronic resources.

In order for libraries to benefit from the above listed numerous applications of QR codes, Lombardo et al. (2012:20) proposed that libraries should promote the use of QR codes by conducting hands-on QR training for their users so that they can effectively use them and also learn how to generate the codes.

2.5.7 Mobile Subject Guides

Libraries have developed subject guides to help their users learn how to access library resources. Subject guides and LibGuides, which was developed by Springshare, is now built in a form that is compatible with mobile devices (Bomhold, 2014:343), Subject guides can also be created by a blog or wiki. These guides according to Boruff and Storie (2014:26) are useful in libraries for helping users learn how to troubleshoot challenges faced during accessing e-journals and how to use library resources by mobile devices.

Mobile technologies offered libraries and librarians an alternative for providing library services and resources in a quick way, improved communication between librarians and their users, increased access to library users since users can access the library remotely through mobile apps and social media (Gikas and Grant, 2013:22; Kumar, 2014: 477).

The advancement in mobile technologies today has increased the convergence of mobile and social media (Pimmer and Tulenko, 2015:2). Mobile technologies have created a powerful channel that accelerated utilisation and access of internet particularly social media (He, 2013: 381). The term “mobile social media” has been coined as result of the convergence of mobile and social media. Social media development companies have developed mobile version and applications (apps) for social media sites like Facebook, Twitter, YouTube, Del.icio.us and Flickr as a means of accessing the social media sites on portable mobile devices (He, 2013: 386). The use of mobile devices for accessing social media has become popular in businesses, entertainment and education (Humphreys, 2013:23). Section 2.6 discusses what social media is and some of the social media tools that are commonly used in libraries and accessible via mobile devices.

2.6 Mobile Social Media

2.6.1 What is Social Media?

The term social media is interchangeable and used by many to refer to Web 2.0 or social networks. This term has always been associated with the O’Reilly Media Web 2.0 Conference in 2004. Social media is broadly described by Gruzd et al. (2012:2341) as a

website or web-based service containing features of web 2.0. Relatedly, Fourie (2015:37) defined social network as:

> *"…an online service that allows members to establish relationships and to share information about themselves and their interests with friends, professional colleagues and others by means of a public or private profile. A member will be able to update their profile with information such as interests, events, status, video, audio, links and photos".*

On the other hand, mobile social media is seen as one of the fast growing areas of research the world over (He, 2013: 391). Mobile social media is described by He (2013: 387) as the use of social media apps and social networking sites through mobile devices. It is also defined by Humphreys (2013:21) as software, apps and/or services that can be accessed by mobile devices for production, distribution and consumption information either in textual or any other media. Because of the wide reception of the social media in most sectors of the society, terms like "global village" with "digital scholars" emerged due to the quick access to information and the powerful tool of sharing information instantly that can be accessed at any corner of the world in (Pietersen, 2015:94).

Some of the social media technologies and tools in use today in libraries include; Facebook, Twitter, Flickr, Blogs, YouTube, Del.icio.us, Instant Messaging (IM), Vodcasts and Podcasts, Wikis, RSS (Real Simple Syndication feeds), Google Docs, Scribd, Skype, Academia.edu, LinkedIn and Zotero. Some library websites nowadays have embedded their social media platforms to encourage users to comment and give feedback of library services (Baro et al., 2014:878).

Social media have positively influenced library operations such as the provision of services in areas like reference service, selective dissemination of information (SDI), announcements, sharing of academic resources as well as library training resources (Edda, 2014:184; Baro et al., 2014:878). The following section will discuss the practical application of these platforms in academic libraries.

2.6.2 Practical Applications of Social Media in Libraries

There are several studies carried-out on the use of social media in libraries. For example, Fourie (2015); Mugera (2015); Mingle, Lamptey, and Hassan (2014); Taylor & Francis Group (2014); du Plessis (2010); Safko & Brake (2009); Reuben (2008), all found that social media tools like Facebook, Blogs, YouTube, Twitter, Flickr, Del.icio.us, LinkedIn, and Instant Messaging (IM) have become a more affordable means of providing libraries services and resources. In the following section these platforms will be discussed in more detail.

2.6.2.1 Facebook

Facebook is a social networking site founded and developed by Mark Zuckerberg in 2004 as a medium for peers to socially interact (Fourie, 2015:44). It is used for creating connections and sharing information in text, photos and videos with friends and/or workmates (Reuben, 2008:3). Facebook users are growing rapidly; by June 2015 it was estimated that out of the projected 3 billion active internet users worldwide, half of them 1.49 billion use Facebook with 65% of them accessing it daily (Hope, 2015). In South Africa, by December 2014 Facebook was ranked the third most visited site and having 890 million users of whom 745 million of them access it with their mobile devices (Fourie, 2015:34).

Social media usage by students' have become so popular that they access them on their mobile devices through Apps for sharing class lecture notes, documents and discussing class lectures, and schedule assignments and group projects (Foti and Mendez, 2014: 68). A study of Web 2.0 applications usage in academic libraries in the United States found that Facebook had 100% participation rate in the studied libraries specifically used to carryout outreach, promotion and marketing, and provision of reference services (Boateng and Liu, 2014: 126).

Mingle et al. (2014) reported similar findings at the Pennsylvania State University that Facebook continued to receive highest traffic rate in reference transactions among other options of answering references questions like email, instant messaging, and in-person interactions. To make Facebook effective in provision of library services, Mingle et al. (2014:188) proposed that librarians should promote their Facebook page at any opportunity the library gets to interact with their users, for example, during library trainings and reference interviews.

2.6.2.2 Blogs

A blog is defined as an online journal that is chronologically organised by the owner and used for communication (Bada, 2015:19). Similarly, Boateng and Liu (2014: 125) described a blog as a website containing information in the form of "brief posts, articles, essays, photos, or other writings and is cared for by an individual or an organization". Libraries are using blogs for dissemination of information like news, events, list of new books acquired, for soliciting feedback from the library patrons through the comments capabilities and also for conducting information literacy (Boateng and Liu, 2014: 125).

The Stanford University Libraries use their blog to create topics for discussions in specific subjects of interests, dissemination research findings, for promotion and marketing of library services and new resources (O'Dell, 2010:248). Taylor & Francis Group (2014:11) and Harinarayana and Raju (2010:76) added that blogs are useful for libraries to provide subject guides and to publish library newsletters.

2.6.2.3 YouTube and Podcasts

YouTube originated because of the desire to share videos online (Safko, 2012: 532). Universities are utilising it to post videos of their activities including interviews for marketing purposes (Fourie, 2015:44). This tool has created a relatively cheap platform for institutions to distribute their digital videos widely online minimising the costs involved in burning information on CDs/DVDs and also courier services for dissemination of information stored in media such as CD-ROMs and DVD-ROMs, which are expensive (Reuben, 2008:4). Similarly, Boateng and Liu (2014: 129) added that, podcasts also do similar work like YouTube though users access information in audio form.

Academic libraries are employing YouTube and podcasts to carryout instructional information in areas of e-resources access both on-campus and off-campus, tutorials, guiding library catalogue search, library tours during orientation and learning referencing (Taylor and Francis Group, 2014:11). Faizi et al. (2014: 129) reported that video instructional materials facilitates knowledge retention and enhances learners' digital skills. The authors proposed

that such videos should encourage problem solving elements and peer-learning so that students' attention is focused on learning the subject.

2.6.2.4 Twitter

Twitter is one of the popular microblogging services that allow their users to post 140 character long messages to members who belong to that group (Safko, 2012: 539). Browsing through many university websites today, you see links to Twitter page/handle of the institution (Fourie, 2015:44). They are used to connect with stakeholders of the institutions they serve (Boateng and Liu, 2014: 127). Libraries are using Twitter share job adverts, links to electronic resources content, videos, library news posted on library website or blog, library events and announcements (Boateng and Liu, 2014: 127; O'Dell, 2010:248).

2.6.2.5 Flickr

Flickr was developed to aid in uploading and organising digital photos online, it allows the owners to add captions and tags without coding as the case in websites. This has facilitated easy search and retrieval of photographic information saving users time (Reuben, 2008:4). Reuben (2008:4) further adds that universities are using the tool for sharing photos of university events, functions, and structures with their stakeholders like "students, alumni, faculty and staff".

Taylor and Francis Group (2014) reported that Flickr is being used in libraries for sharing library photos that convey specific activities of the library like training workshops, refurbishment, and covers of newly acquired textbooks as well as pictures of library staff particularly new recruits.

2.6.2.6 Del.icio.us

This social media tool is used for bookmarking websites so that users or owners can access the bookmarks online from any computer or mobile device anywhere and anytime. Del.icio.us uses tags to organise contents for easy search, storage and retrieval (Reuben, 2008:4; Boateng and Liu, 2014: 130). The tool is further used to facilitate sharing bookmarks,

accessing links bookmarked by friends who signed into the service by browsing and searching, and also bookmarking news articles to be retrieved later (Reuben, 2008).

Libraries are using Del.icio.us for bookmarking research guides and subject specific e-resource articles that can be shared by users (Boateng and Liu, 2014: 130). Del.icio.us is favoured in libraries according to Boateng and Liu (2014: 130) because of its role in saving time in searches and management of online information that is refereed several times. This means that users will not need to memorise the Uniform Resource Locator (URL) of the website.

2.6.2.7 Instant Messaging

Instant messaging (IM) is a social media tool that is used extensively by US libraries according to Boateng and Liu (2014: 126) to provide virtual reference services. IM is a chat platform for providing reference service in text or voice chat form. With such tools available in libraries, library users can ask librarians questions about the library online and get instantaneous response (Harinarayana and Raju, 2010:81). The commonly used platforms for IM services employed by libraries include; Google Talk, Yahoo Messenger, AIM, Skype, Meebo (Boateng and Liu, 2014: 129).

2.6.2.8 Really Simple Syndication

As the name suggests the Really Simple Syndication (RSS) tool is used to harvest content from websites and blogs instantly from the time it is posted on specific website and instantly send the same website content to the subscribers of the RSS feed regularly (Mosha et al., 2015:6). It is applicable in libraries for disseminating and obtaining news services, announcements, workshops/instructions, exhibitions, and alerting library users of new acquisitions like textbooks and e-resources (Mosha et al., 2015:6; Boateng and Liu, 2014: 128; O'Dell, 2010:248; Harinarayana and Raju, 2010:81).

2.6.2.9 Wikis

A wiki is a "browser-based web platform that lets volunteers contribute information based on their expertise and knowledge, and permits them to edit content within articles on specific

subjects (Safko, 2012:167). The originators of wikis aimed at creating a tool that will encourage people to share their knowledge and collaborate. This tool allows people subscribed to the wiki to comment and edit a post (Mosha et al., 2015:9). Boateng and Liu (2014: 130) and Akeriwa et al. (2014:18) in their studies found out that librarians are using wikis for collaborating and working on one document such as meeting minutes, policies and procedures by multiple people concurrently. Furthermore, wikis are used for hosting training resources, project documents, catalogue of library resources, library policy documents, and subject guides (Boateng and Liu, 2014: 130; Akeriwa et al., 2014:18).

At Muni University before the academic library developed a website, the library deployed Google Site which uses the same principles of a wiki to post opening hours, links to electronic resources and PDF files of e-books, library rules and regulations. This is simple to use and affordable because there is no need for web programming skills, as well as having ICT infrastructure for hosting the wiki. Library users are enrolled to use the site and review and comment on the resources and services provided to them by the library. Figure 2.8 represents a screenshot of Muni University Library Google Site.

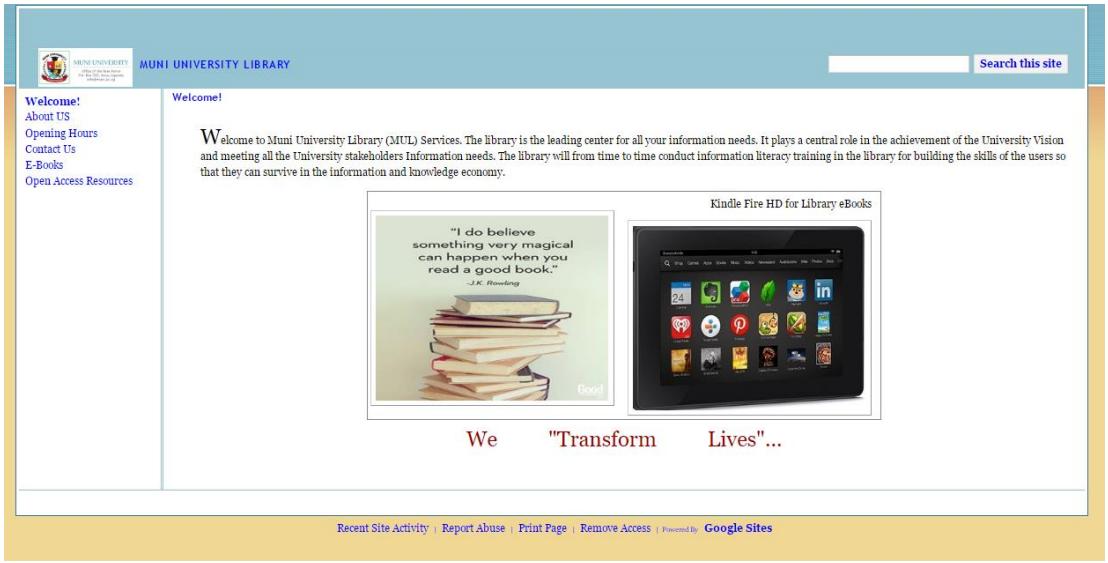


Figure 2.9: Screenshot of Muni University Library Google site

2.7 Opportunities and Challenges for Mobile Technologies and Social Media in Libraries

As discussed in section 2.3, 2.5 and 2.6 above, mobile social media provides a suitable alternative for academic libraries and librarians to deliver library services to their users anytime because of the continued improvement in the development of technology that enhanced the capabilities of these technologies. Below are some of the opportunities that libraries can harness from mobile social media and the challenges that can impede their quick adoption and use in libraries.

2.7.1 Opportunities

Mobile technologies as channels for accessing social media are powerful tools in the education sector. Foti and Mendez (2014:72) reported that students are using social media for sharing information, particularly course content and class discussion and scheduling projects. On the other hand, portability and powerful computing speeds of mobile devices have been preferred by students for accessing academic content and supporting their learning at any location and time (Foti and Mendez, 2014:72). Mobile technologies have become cheaper and are facilitating people to have quicker and easier points of access to internet skipping the complex fixed line infrastructure building procedures in Africa (Bridges et al., 2010:310).

Several studies conducted worldwide indicate continued positive reception of social media in libraries. The study conducted by Boateng and Liu (2014:126) about use and application of web 2.0 in top United States academic libraries found that 100% of the libraries studied were actively using social media with Facebook and Twitter being the most popular for providing library services. The results of the study that assessed the awareness and use of Web 2.0 tools in African university libraries by Baro et al. (2014:868) were consistent with the findings of Boateng and Liu (2014:126) indicating high usage social media in libraries.

As result of the popularity of these technologies, some academic libraries are using social media to cheaply market library services, share announcements, post photos and offer online reference service through chats (Baro et al., 2014:867; Baro et al., 2013:10). In Tanzania, students are using social media for organising their online academic information by bookmarking and also for sharing and dissemination videos and photos (Edda, 2014:192).

These findings indicate that social media platforms have become valuable means for enhancing teaching information literacy and posting library instruction materials in the contemporary libraries (Zorica, Ivanjko and Beneec, 2012: 1131; Palmer, 2014:611).
The learning and teaching landscape is changing as social media comes to play its role in the education sector. For instance, Faizi et al. (2015:36) found that the widely free video courses and tutorials online hosted by video sharing tools like YouTube and audio recording contained in podcasts are offering another cheap means of self-learning by students, hence improving their learning especially the slow learners. Relatedly, librarians who responded to the Taylor and Francis Group survey predicted that social media will be a valuable asset for the libraries of the future due to their rapid adoption rate (Taylor and Francis Group, 2014:3).

Going forward, libraries and librarians in developing countries should consider using these popular tools to communicate with their users who prefer to receive library services at locations favourable to them (Taylor and Francis Group, 2014:3). Libraries cannot afford to neglect the opportunities offered by these technologies since the biggest percentage of their customers are online using social media (Baro et al., 2014:874).

Social media plays a vital role in the provision of library services to the young generation (Pietersen, 2015:89). For example, some library users are demanding their librarians to provide them library services and resources via social media and mobile technologies. A case in point is the study by Matsheka (2012) that found that users demanded to find information from library updates about new book arrivals, current affairs, training opportunities, mobile library (the physical mobile library service) visits in their geographical area, how to use referencing and citation tools like Refworks and link to the UNISA book request system.

In summary, mobile technologies and social media have created opportunities for libraries and librarians to expand the ways in which they deliver services to their clients. The Taylor and Francis Group (2014:3) proposed that libraries should develop evaluation frameworks for assessing the effectiveness of social media by developing specific metrics for indicating the impact of these tools on the use of resources, especially borrowed items and reference queries answered. This, according to the Taylor and Francis Group, would help the library tap the benefits of these resources better by improving areas that don’t yield the required results.

With these opportunities also come challenges that the academic library must be aware of and address. The next section discusses the challenges for implementation of mobile and social media technologies in academic libraries.

2.7.2 Challenges to Implementing Mobile Technologies and Social Media in Libraries

Despite of the numerous benefits and opportunities offered by mobile technologies and social media, a number of issues and users concerns need to be addressed in order to the leverage the potentials of these technologies. Some of these issues/barriers are discussed below:

2.7.2.1 Mobile Device Concerns

Most mobile devices like smartphones have small screens that make searching for information difficult, especially with long text. Also, reading text on them for long periods may cause eyestrain, especially in the elderly who in most cases prefer physical touch, feeling and highlighting text while reading (Song and Lee, 2012:586; Cummings et al., 2010:23; Baggett and Williams, 2012; Akeriwa et al., 2014:8; De Wee, 2013:74). This problem can be overcome by conducting user trainings, especially in areas of change management and how to effectively use the device. Some of the mobile device concerns raised by scholars challenging the delivery of library services are discussed below.

- Some mobile devices are not durable, have limited battery life, have small memory storage capacity, have low rate of data transmission, have poor resolution, do not support copying and printing capability, have interface problems and archiving issues, and constant changes in mobile technologies make some of them obsolete within a short period of time (Malathy and Kantha, 2013:361; Khan, et al., 2015:914; Callow and England, 2011:5; Akeriwa et al., 2014:8).
- Some of the mobile devices are not fit for the African environment where dust and excessive much heat do not suit them. Chuene et al. (2014: 301) reported concerns of dust and breakage as big challenges in the implementation of an e-reader project in primary education in Ghana.
- Accessing content from some of these devices is difficult because of the lack of digital content for mobile devices (Philbeck, 2016, Boruff and Storie, 2014:22; Akeriwa et al., 2015: 287; Khan, et al., 2015:916), software compatibility issues like access of e-

resources via ezyproxy and "authentication processes for accessing those products," (Callow and England, 2011:3; Boruff and Storie, 2014:22), and problems of accessing wireless internet in some places by library users (Boruff and Storie, 2014:25; Philbeck, 2016).

2.7.2.2 Cost of Integrating Mobile Technology

Integrating mobile technologies in libraries is affected by the high costs of these technologies. The costs for buying mobile device with better capabilities for accessing online information and internet data in African countries and are high (Khan, et al., 2015:916; Okello-Obura and Ssekitto, 2015:14). These costs discourage people from embracing these technologies for learning. For instance, Song and Lee (2012:584) suggested that the high technology costs have made some learners to consider such technologies unnecessary for learning.

Moreover, the broadband penetration is still low in remote parts of Africa. This could be attributed to the high ICT infrastructure building costs, which discourages investments in the rural areas (Muneja and Abungu, 2012). Governments need to invest in extending broadband connectivity to rural areas and subsidise internet costs (Okello-Obura and Ssekitto, 2015:14). This poor infrastructure has contributed to the unreliable internet connectivity in some parts of Africa and consequently slow rates of adoption of mobile technologies and social media in education (Edda, 2014:197; Akeriwa et al., 2014:7; Taylor and Francis Group, 2014:6; Mosha et al., 2015:11).

2.7.2.3 Inadequate Skills

Social media tools are not effectively used by many due to many factors; one particular common constraint is the lack of skills. Baro et al. (2014:874) found that 82.1% of Nigerian librarians lacked skills of utilising Web 2.0 tools. Their study established that librarians in African universities learnt using Web 2.0 tools through either self-practice or colleagues, as well as workshops and continuous professional development (CPD) programmes.

In order to effectively utilise emerging technologies in academic libraries, librarians and library users requires a set of skills for both customising social media and developing library mobile applications and operating mobile devices. In support of this view, Malathy and

Kantha, (2013:365), Bridges et al. (2010:310) and Philbeck (2016) stated that librarians, publisher and library users require knowledge on operating the hardware and software, creating mobile content (mobile websites, MOPAC, virtual tours, e-books and e-journals), skills for searching for information, and using library apps. Absence or lack of these skills will curtail and slow the speed of implementing these technologies in libraries. Librarians must acquire emerging technologies knowledge in order to help train library users (Akeriwa et al., 2014:8; Callow and England, 2011:5; Boruff and Storie, 2014:25).

Re-training librarians in relevant emerging technologies can help them remain relevant, and will reduce the negative perception of users about social media, as well as bridge the knowledge and skills gap in management of social media tools (Mosha et al., 2015:11; Muneja and Abungu, 2012; Baro et al., 2014:874; Taylor and Francis Group, 2014:6).

2.7.2.4 Lending Device Challenges

Many libraries' policies on lending of the mobile devices acquired by the library are clear on who is allowed to upload and content to the devices. De Wee (2013:45) citing Anderson and Andrews (2011:24) introduced an interesting discussion whether library users are to be allowed to download content into the devices on their own or it is only a duty of the library to upload the content. Assigning such task to librarians is tricky because libraries with a big population of varying subjects becomes a daunting task for librarians since gauging library patrons interest are hard. Anderson and Andrews (2011) again raises another challenge with measuring usage statistics for the content used from the mobile devices to ascertain their usefulness. According to them, there are no tools developed yet for counting usage of the contents on the mobile devices. This is a challenge for libraries and software developers to address the gap, statistics are vital in librarianship, they act as a means of accountability for the financial resources given to libraries through institutional budget support and donor funds (De Wee, 2013:45). Having mobile learning content and providing library social media services is not enough, measuring usability is very important to assess impact (Bomhold, 2014:343).

A study by Pietersen (2015:79) reported that the fear of losing borrowed mobile devices leads to low utilisation of library mobile devices and social media in libraries. Pietersen's study found that 36.92 percent of the respondents did not use library mobile devices because of the

fear that the devices may be stolen from them and be asked replace the devices at their own cost.

2.7.2.5 Resistance to Change

Despite the wide opportunities offered by the technologies discussed in section 2.7.1, a cross-section of people also believe that mobile technologies can be harmful to learners and considered them fit for recreation-related tasks, but not for learning due to their disruptive nature (Khan, et al., 2015:914; Li, 2013:226). Some techno-opportunists consider these technologies more technical and require skills for administration, and time to learn and practice using them (Chu and Du, 2013:70). Workshops and seminars need to be organised regularly for change management and sensitization of stakeholders so that they are motivated and believe that mobile devices are effective for information seeking alongside other uses of the mobile devices like phone calls, SMS, taking pictures and recording videos (Khan, et al., 2015:914; Li, 2013:226).

2.7.2.6 Unreliable Electricity

Unreliable electricity in most African countries is hindering many African libraries from implementing library technology projects effectively (Mosha et al., 2015:11; Ponelis, and Holmner, 2015:168; Muneja and Abungu, 2012). As Baro et al (2014:877) and Baro et al. (2013: 172) postulated, libraries should seek alternative sources of power like standby generators, and harvest solar energy which is abundant in Africa to stabilise power in libraries.

2.7.2.7 Sustainability

Some institutions, including libraries, are losing online clients because of the failure to sustain and update their social media pages. For example, du Plessis (2010:7) indicated that institutions lose their followers due to failure of posting new content. Hence, sustaining online clients is a big issue that should be addressed. Taylor and Francis Group (2014:6), Fourie (2015:40), Muneja and Abungu (2012) suggested that libraries should work hard to maintain their relationship with their online users by engaging them in discussion, building collaboration with their faculty to promote the use of social media in education. Librarians

should monitor the users' behaviour in the usage of library social media sites in order to understand their needs better (Fourie, 2015:31).

With these challenges academic libraries need to strategise in order to benefit from the numerous opportunities offered by technologies.The next section will discuss the approaches the can be employed by academic libraries to benefit from these technologies.

2.8 Strategies for Implementing Mobile Technologies and Social Media in Libraries

In order to leverage the opportunities offered by social media and mobile technologies, proper planning is a requisite. Staff training and forming alliances or collaborations and partnerships with organisations or institutions that can offer funding for mobile devices, mobile library e-resources and internet bandwidth is vital (Negi, 2014:15; Vassilakaki: 2014:180). The next subsections will discuss some of the approaches that libraries can employ to successful benefit from these trending technologies of the 21st century.

2.8.1 Strategic Plan

Implementation of mobile technologies in libraries requires comprehensive planning on marketing and promoting the use of the devices, acquiring content, handling security issues, and internet connectivity. According to Johnson, et al. (2015: 18) planning should involve development of policies and implementation strategies, which should align with the institutions strategic plan. The strategy should clearly explain how the effectiveness and use of mobile devices will be evaluated and assessed. Similarly, Malathy and Kantha (2013:365) state that planning should also address security and authentication issues because the risks of exposing devices to security threats due to misuse of internet are high.

In addition, library technology strategies should be used to guide the use of social media (Baro et al., 2014: 875) and include development of social media and other technology policies (Edda, 2014:198; Okello-Obura and Ssekitto, 2015:19; Mugera,(2015:3; Muneja and Abungu, 2012). The policy will be a useful framework for promoting effective use of social media sites by both staff and students, and will provide guidelines for social media use by libraries. One example of an academic library that has extensively deployed Web 2.0 tools is the University of Pretoria that developed an e-information strategy to promote adoption and

utilisation of web 2.0 tools as a means of providing library services (Penzhorn and Pienaar, 2009: 73).

Furthermore, the strategic plan should also mobilise for high internet bandwidth and wireless technology infrastructure so that library mobile services can be used effectively (Khan, et al., 2015:916; De Wee, 2013:74). Schumann and Kende (2013:4) proposed that governments should liberalise the ICT sector so that other stakeholders join the market to encourage competition, which ultimately would reduce internet costs.

2.8.2 Training

Like any other technology to be adopted, there is need for end-user competence building through training. Mingle et al. (2014: 192) reported that 98 percent of respondents in Ghana suggested that librarians should help their patrons learn and gain skills and knowledge required to utilise social media technologies through regular trainings. Mosha et al. (2015:9) proposed that the content of the user training should include a module on how to create social media accounts and join existing/liking social pages.

Pietersen (2015:18) suggested that librarians should learn new skills and familiarise themselves with the emerging technologies so that they are relevant and guide their library users. Also, librarians need to learn how to operate and manage mobile devices, load content on mobile devices, and troubleshoot hardware and software so that they can help their patrons use the devices effectively (Bridges, Rempel and Griggs, 2010:313; Negi, 2014:15; Vassilakaki, 2014:180). Dresselhaus and Shrode (2012: 93) proposed that libraries should build a talented implementation team for implementing these technologies. The team should include ICT department to help in programming and Faculty to contribute content. However, Dresselhaus and Shrode (2012: 93) advised that the library should take lead of the team during implementation because they are close to vendors of the content and library users, making them better advocacy agents for mobile device.

2.8.3 Collaborations and Partnerships

For effective implementation of technologies in libraries, libraries need to collaborate with other departments within their institutions, including vendors to contribute content and

applications for accessing information from databases, and library users to give feedback about the mobile services in the library (Negi, 2014:15; Vassilakaki, 2014:180; ACRL, 2014: 295). Elahi and Islam (2014) suggested that academic libraries together with the management of their institutions should search for collaborators and partners that can support the library budgets, specifically for acquiring digital content applicable to mobile devices such as e-readers, improving internet connectivity and broadband and training library staff and users. This will contribute greatly in supporting library efforts for using mobile technologies and social media-based library services.

2.8.4 Promotion and Assessment

Formulation of marketing and promotion initiatives by libraries is very important in facilitating the utilisation of social media in libraries. Creating library Facebook, Twitter or any other social media site is not enough; libraries should publish them so that their impact may be felt by the library users (Pietersen, 2015:6). According to Okello-Obura and Ssekitto (2015:19), the campaign for awareness of social media use in education should be combined with stakeholder initiatives at institutions of learning. Likewise, to carryout effective marketing and promotion of social media, libraries should work in collaboration with other departments of the university, as is the case at the University of Pretoria where the library and other departments worked together to develop the Web 2.0 (Penzhorn and Pienaar (2009:75).

It is proposed that reference and information desks of libraries should carry the promotion services of their mobile devices and services so that users can know their availability (Dresselhaus and Shrode, 2012: 95). Besides promotions and marketing, libraries should also carryout assessments of how their users utilise social media and mobile technologies (Dresselhaus and Shrode, 2012: 95; Bridges et al., 2010:316).

2.8.5 Change Management

The fear of change has continued to hinder adoption of technologies in many institutions worldwide. Therefore, in order to avoid resistance to change, libraries should sensitise users through workshops and trainings so that they can benefit from the opportunities provided by mobile devices and social media services discussed in the previous sections. It is important that libraries get interested in understanding user habits and attitudes towards the use of

mobile services and resources. For instane, Edinburgh University Library conducts regular surveys in order to understand user interests in mobile services in order to address user concerns (Paterson and Low, 2011:419). Such interactions and conversations with library users are helpful in changing any negative perceptions towards mobile technologies.

2. 9 Conclusions

Social media tools and mobile technologies have become favoured alternatives for proving services in libraries. Callow and England (2011:1) suggest that technologies offer opportunities for libraries and librarians to diversify the ways of delivering services to users. However, this does not imply that technologies will replace the traditional roles of libraries of such as cataloguing, offering physical reference service, or circulation. In implementing these technologies, libraries will be faced with challenges including lack of skills, unreliable electricity, high costs of internet, and resistance to change.

In order to serve the contemporary library users better, libraries must lay strategies like development of social media and other emerging technologies policies, formulation of marketing and promotion initiatives, and creation of collaboration and partnerships. Also, librarians should learn skills of using social media and other technologies so that they can serve the demands of their users who prefer to access library services at any time and from anywhere. Literature has shown that libraries of all sizes worldwide have deployed mobile technologies to provide social media library services such as reference services, MOPAC, e-journals and databases, e-books, announcements, virtual tours, and information literacy. For librarians to remain relevant in a contemporary society, they must adopt and adapt these technologies for providing library services and resources.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The main objective of this study was to examine how mobile technologies can be applied to improve social media-based library services at Muni University Library. This chapter discusses the research approach and methods, the reasons for the methods chosen, the study population, and data collection, analysis, and presentation.

3.2 Research Approach

Research design or approach is described as the plan that is used to decide the methods of data collection and analysis (Maree, 2007:70; Leedy and Ormrod, 2013:74). For this study, a qualitative research approach using questionnaires and interviews for collecting data was adopted. Leedy and Ormrod (2013:74) and Blumberg, Cooper, and Schindler (2005:195) further contend that the success of any research depends on how well the researcher plans his/her resources, procedures and forms of data that will be used in the research.

There are basically two methods of classifying research studies, the quantitative and qualitative. Quantitative research is concerned with measurements in the form of numbers, figures, counts and scales for analysing variables (Bless, Higson-Smith, and Kagee, 2013:56). On the other hand, a qualitative study is concerned with understanding choices made by people, their behaviours, attitudes, opinions and motivations regarding a specific subject or topic (Kothari, 2004:5; QRCA, 2015; Tracy, 2013:5). It is within this context of ascertaining the opinions and attitudes of respondents with regard to the use of mobile technologies in providing social media based library services that a qualitative research approach using questionnaires and interviews for collecting data were used in this study.

3.3 Study Population

3.3.1 Study Location

This study was conducted at Muni University Library in Uganda. Muni University is a public university located in the northwest Uganda. It is the only public university located in the area with a unique foundation, namely the first of its kind to be started in the country without inheriting an existing diploma awarding institution of learning (Muni University, 2016a). The advantage that Muni University has gained from such a foundation is that all the university systems of operation are customised to fill a particular niche. One such unique feature of Muni University is that it embraces ICT as a leading tool in advancing their mandate. It is the University's requirement that all students come with their own tablet or laptop as learning aid (Muni University, 2016a).

The Muni University Library, where this study was conducted, was founded in 2013. Within the context of achieving the university's mandate, the library has also embraced ICT, particularly social media, for promoting and increasing access to information services offered to students, staff, and the public (Muni University, 2016a). It currently has a Facebook Page and WhatsApp group(s). In addition, the library adopted the use of mobile technologies by acquiring Kindle readers for mobile library service delivery.

3.3.2 Target Population

Target population is defined by Bless, Higson-Smith, and Kagee (2013:162) as the set of elements that are used in a research. Such elements contain a specific pool of cases of people, businesses, or geographical locations and boundaries that a study relies on for making conclusions (Neuman, 1997: 203). The target population for this study were undergraduate students and members of staff of the library. The university currently has no graduate school. As a result no graduate students were selected for this study.

The participation of the students was vital since they were the primary library users. For the purpose of this study, only the 200 students who were registered for the 2015/2016 academic year were considered (Muni University, 2016b: 32). This number excluded first year students registered for the 2016/2017 academic year. This was done deliberately so as to seek opinions

of only "mature" library users. Also, it was the researcher's opinion that first year students had not yet actively used an academic library by the time the study commenced. Thus, the first year students were not regarded as suitable participants to provide relevant information.

The members of staff of the University Library were used as participants for the study because of their role in providing information resources and services at library.

3.3.3 Sampling

Sampling can be defined as the process of "choosing a few from a bigger population to be used in a study for estimating the occurrence of an unknown information or situation, or outcome" representative of the bigger population studied (Kumar, 2011:193).

Convenience sampling, a form of nonprobability sampling (Leedy & Ormrod, 2010: 214), was used in this study. Convenience sampling, is described as a sample that takes units or cases of study that are easy to reach, readily and conveniently available (Neuman, 2012: 147; Maree, 2007:177). It is a method often used in a study where the sample is not ascertained beforehand and the researcher does not specifically forecast which members of the population will be involved and participate in the study.

At the time of data collection, the Muni University students, who were the primary library users (and targeted population for the study) were, unfortunately, not all accessible to the researcher. This was because several students were busy with off-campus internship programmes and some were already on vacation. Taking into consideration the limited time and budget available to the researcher for the timely completion of his research, convenience sampling was chosen as the most appropriate method of sampling. Only one hundred (100) students responded to the request to participate in the study, while all four (4) members of staff of the library responded to the request to participate in the study.

3.4 Data Collection

3.4.1 Method of Data Collection

Data collection is a process of "gathering information to serve or prove some facts" (Kombo & Tromp (2006:99). There are many different primary data collection methods; the decision of which method to use is determined by the purpose of the study and the skills of the researcher including resources like time and finances (Kumar, 2011:140). Two methods of data collection were used: questionnaires and interviews. The questionnaires were used for collecting data from the students while semi-structured interviews were conducted with the library staff.

These two methods were used to supplement each other. Questionnaires were used to ascertain the library users' perceptions on the use of mobile technologies for providing library services via social media, while the interviews conducted with the staff aimed to solicit staff views on whether and/or why they were providing such services or planning to implement these technologies in the library.

3.4.2 Study Questionnaires

A questionnaire can be defined as a list of written closely defined questions that respondents are requested to record their responses (Sekaran & Bougie, 2013:147). Such questions may be either in print or electronic form for the respondents to choose or write their responses (Kothari, 2004:100; Odiya, 2009:171). The questionnaires may be distributed in person by the researcher, or sent by postal services, and may also be distributed electronically to respondents (Sekaran & Bougie, 2013:147).

The study used print (hard copy) questionnaires. Electronic questionnaires were not feasible for this study because the students were participating in off-campus internships or those already on vacation were in communities far away from the University without any reliable or easy access to the internet. The most practical option for data collection in this study was therefore the questionnaires to be printed and distributed by hand to the students within physical reach on campus.

There are many benefits accredited to the use of questionnaires as data collection tool, some of which are discussed in following sub-section.

3.4.2.1 Advantages of Questionnaires

- Questionnaires promote confidentiality since the respondents' details like name are not required as such respondents can freely express their opinions without fear (Kombo and Tromp, 2006:89; Kothari, 2004: 100). Relatedly, questionnaires also reduce chances for bias since the respondent does not interface directly with the researcher when answering the questions (Kumar, 2011: 148).

- There is flexibility in completing the questionnaires since the respondents have enough time to think through the questions before responding. This is convenient to respondents who do not have time to fill the questionnaire immediately at the time of distribution (Odiya, 2009:171; Kothari, 2004: 100). This was useful in this study for both the researcher and respondent since the university is non-residential and students operate mainly from home, visiting the library only to access reading space and borrow textbooks.

- Personally distributing the questionnaires gives the researcher the opportunity to motivate the respondents to participate in the study by explaining to them the research topic and reasons for collecting data (Sekaran and Bougie, 2013:147). The researcher can also respond to unclear questions raised by respondent when filling the questionnaires.

However, despite of the above listed advantages, there are also problems associated with questionnaires. These are discussed in the following sub-section.

3.4.2.2 Disadvantages of Questionnaires

- The chances of low response rates and incomplete self-administered questionnaires could be high due to lack of motivation and supervision by the researcher (Kombo and Tromp, 2006:89; Kothari, 2004:101). In this study, the significance and urgency of the

study was explained to the respondents at the time of distributing the questionnaires, and also personal follow up of the distributed questionnaires was made.

- Questionnaires limit the researcher from probing the respondent in contrast to an interview where the information provided can be followed up and supplemented by the respondent (Kumar, 2011:149). However, the questionnaire developed for this study was aimed at being comprehensive enough to collect all the required data to answer the research question.

3.4.2.3 Developing the Questionnaire

The questionnaire was developed to answer the main research questions and sub-questions. Kumar (2011:145) contends that questions developed should be interactive so that the respondents have a feeling of a conversation with the researcher. For this questionnaire efforts were made to not only develop easy-to-answer questions in simple language for easy understanding, but easy sequence-flow questions containing clear instruction were developed to avoid misunderstanding of individual questions. It contained both open-ended questions and closed-ended questions. The questionnaire was divided into three parts as follows:

- Part 1 asked demographic information.
- In Part 2 questions were about the use of mobile devices. The respondents were asked to state whether they owned mobile devices or had any intention of acquiring one for those without, and they were also asked to propose which library services they would like to access by means of their mobile device.
- Part 3 questions covered the use of social media for provision of library services. Respondents were asked whether they use social media or not, and also whether they use their mobile devices to access any Social media tools and applications. The section concludes asking which social media applications and tools can be used to access library resources and services.

A sample questionnaire is attached as Appendix A.

3.4.3 Interviews

Kumar (2014:176) describes an interview as a data collection method which involves person-to-person dialogue, with the researcher asking questions and respondents giving answers orally. In this study, face-to-face interviews were conducted for collecting data from the members of staff of the library. Data was collected using an interview guide. This kind of interview is commended because it gives the interviewer an opportunity to clarify doubts, rephrase questions so that they can be understood by the respondents and allows for gathering of more data from the respondents' nonverbal signals (Sekaran and Bougie, 2013:124).

3.4.3.1 Advantages of Interviews

Some of the benefits of data collection method with interview as enumerated by Kombo and Tromp (2006:94) and Kothari (2004:98) include:

- The data collected from interviews are more reliable because the respondents have opportunity to explain their interpretation of the ideas given in the answers to some questions and also ambiguity and unclear questions can be resolved easily. In other words, the researcher has an opportunity to get in-depth information from the respondents,

- It is a faster way of getting instant and immediate response from the research questions unlike the questionnaire data collection method that is characterised with low response rates and incomplete questionnaire forms,

- The researcher gets a better understanding of his respondent based on his/her personal characteristics and also collects extra information from the responses given or observation made during the interview outside the formulated questions for the interview.

3.4.3.2 Disadvantages of Interviews

Some of the disadvantages of collecting data using interview method as described by Kombo and Tromp (2006:95), Kothari (2004:99) included;

- Respondents can feel that the interviewer is asking questions which are sensitive and causing embarrassment. This may make some respondents noncompliant and unfriendly to the interviewer. To overcome this challenge in this study, the interview questions guide contained a cover letter explaining the purpose of the interview which was emailed to the interviewees before the scheduled interview so that they could prepare and save time.

- Data collection recording instruments such as tape recorders or video recordings could frighten some respondents. Some participants may withdraw from the interview when they realise that they are being recorded and fearing that what they may say would be used against them especially if the subject/topic of the study is a controversial one. This will affect the final results got from the interviews as some of the respondents may not open up. In this study such problems were overcome by informing the respondents prior to the interview that their responses were going to be recorded and their permission was also requested to allow the interviewer to do so.

3.4.3.3 Interview Guide and Design

In order to have meaningful dialogue during the data collection, an interview guide was developed and used for gathering responses from Muni University Librarians. An interview guide is described by (Kothari, 2004:186) as a document containing a set of questions to be used in the interview process. As Kombo and Tromp (2006:97) explained the interview guide is developed to ensure that the researcher asks each respondent similar questions, and also to ensure that the data gathered were reliable. In the case of the semi-structured interviews, participants were given opportunities to elaborate their answers or even introduce new issues, where applicable.

The questions were developed carefully according to themes which addressed the study objectives. The interview guide questions (see Appendix B) were grouped into: Biographical information; Use of mobile technologies in libraries; Use of social media tools and applications; Opportunities, challenges and strategies for implementation of mobile technologies and social media in libraries; and General comments from respondents.

Prior to the interviews, members of staff of the library were requested by means of a personal e-mail to suggest a time and venue suitable for them where the interviews could be held. The data collected was recorded, coded for analysis, and presentation as discussed in the section below.

3.5 Analysis of Data

Data analysis entailed developing methods and techniques for organizing the collected data to extracted meaning from the information given by the respondents for the achievement of study objectives. The sub-divisions created in the data collection instruments were used for the interpretation of the data collected in the study

Data were pre-processing to eliminate unusable data, interpret ambiguous answers, and also verify and reject contradictory responses given to the same question. Kothari (2004:18) explains that data editing in the research process involves the activities which aims at refining the collected data to gain high quality ready for coding. Data were cleaned by cross-checking whether the questionnaires were fully answered, accurate and consistent by removing irrelevant responses in the raw data. This process ensured that the data collected was ready and proper for the coding process

Coding of research data according to Odiya (2009: 221) is a process of categorising or classifying responses from the data collected by assigning to them numbers or appropriate words or symbols. Data were then coded according the themes that were created in the data collection instruments. Responses were carefully read to ensure that appropriate and inclusive themes were developed to accommodate all the responses given and to aid the data analysis and interpretation process. The data collected from the closed-ended questions were recorded, summed and percentages of responses were generated, while the responses to open-ended questions which were qualitative in nature were classified according to the themes developed to group all similar responses to questions. Microsoft Excel was used for tabulating the coded data used in the analysis, interpretation and presentation.

3.6 Ethical Considerations

Research ethics is an important component of any research which explains the regulatory codes of practice and standards that guide the process of research. This according to Odiya (2009:210) should include; 1) informed consent of participation in the study, 2) access and acceptance to carry out research in an institution; 3) privacy and confidentiality to respondents' identities; and 4) voluntary participation in the study.

Respondents were approached and requested to voluntarily participate in the study. Confidentiality was ensured by developing data collection tools that did not contain any details that led to identification of the respondents. Permission was obtained from the relevant Muni University authorities to conduct research with the students and staff.

In addition, ethical clearance was obtained from the Ethics Committee at the Department of Information Science of the University of Pretoria prior to data collection indicating the purpose of the research, assurance of confidentiality of information that was provided in the study and validity of the data collection instruments.

3.7 Conclusion

This chapter discussed the research methodology used in the study. The context of the study, population, sampling methods, data collection methods and instruments, data analysis as well as ethical considerations taken into account, were covered.
The next chapter will present the study findings obtained from the questionnaires and interviews.

CHAPTER FOUR

ANALYSIS OF DATA

4.1. Introduction

This chapter presents the analysis of the data collected from the study. Questionnaires were used to collect data from the students while the interviews were conducted with the library staff. A total of 100 questionnaires were randomly distributed to students and 88 (88 per cent) were returned. Four library members of staff were interviewed. The chapter is divided into sub-sections as indicated in the data collection tools (i.e. demographic information, use of mobile devices, and use of social media for provision of library services). The opportunities, challenges and strategies for implementation of mobile technologies and social media in libraries are presented here.

4.2. Findings from the Questionnaires

4.2.1 Demographic Information

The respondents were asked to provide information about their study programme and year of study. From the 88 per cent respondents, 24 (27.3 per cent) were studying Bachelors of Science in Information Technology (ITM), 64 (72.7 per cent) studying Bachelors of Information Systems (ISM). The majority of the respondents (63.6 per cent) were in their second year of study while the remaining 36.4 per cent were in their third year of study. As was explained in chapter three first year students were not considered in this study because they were new at the university and had not used Muni University library at the time of data collection.

4.2.2 Use of Mobile Devices

In this section, the respondents were asked to indicate whether they owned any mobile devices, the types of devices they owned that connect to the internet, the uses of the mobile devices in the daily lives of the respondents, as well as the kind of library services that respondents prefer to access through mobile devices. The following subsections present the findings.

4.2.2.1 Ownership of Mobile Devices

Respondents were asked to state whether they owned any mobile device(s), such as a Smartphone, iPad, iPod touch, tablet, laptop and e-book reader (Kindle). The findings show that 85 (96.6 percent) of the respondents owned mobile device(s) which underscores that the majority of students do own mobile devices as required by the University Management. However, it is surprising that 3.4 percent of students don't own mobile devices in spite of university policy requiring the devices (Muni University, 2015). A further question was asked for those who did not own any mobile device whether they had an intention of acquiring a mobile device, their responses (3.4 percent) were all in the affirmative.

The 96.6% respondents who owned mobile devices were further asked to indicate the type of devices they owned with capabilities of connecting to the internet. From the findings, it can be observed that the majority of respondents owned smart mobile phones followed by laptops and tablets. These findings are illustrated in Figure 4.1 below.

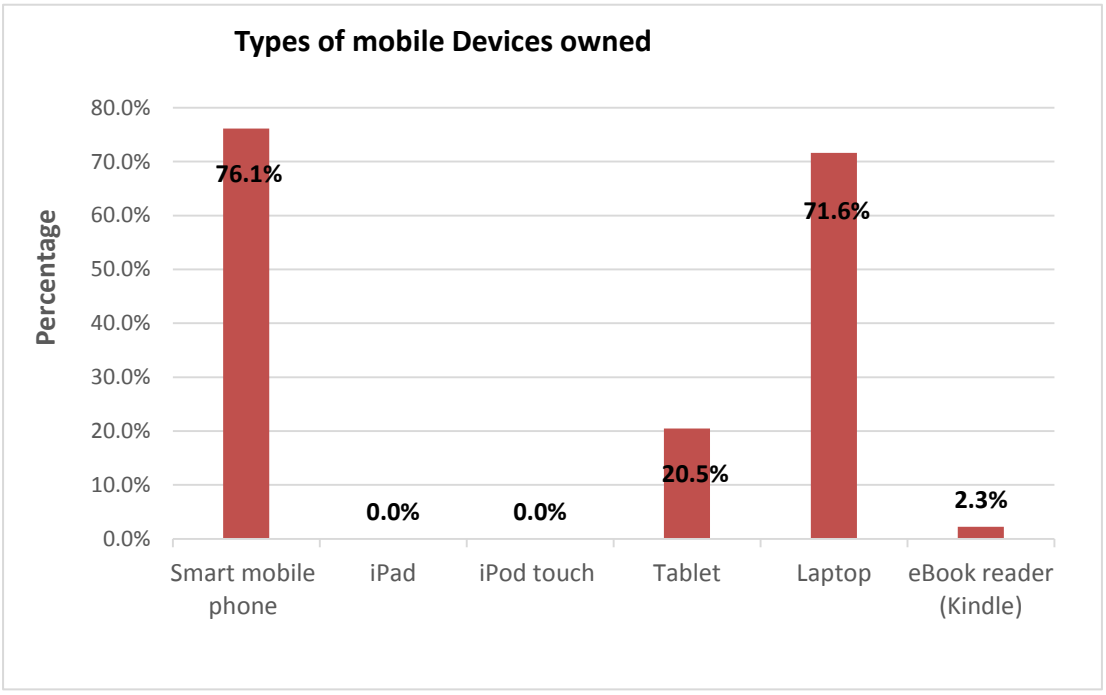


Figure 4.1: Type of mobile device owned

The findings also show that some respondents owned more than one device that is why the numbers of the respondents of those who own mobile devices is more than the total respondents (88 participants).

4.2.2.2. What Respondents Use Their Mobile Devices For

Mobile devices play a vital role in communication and access to information. They change the way of communication and access to information in the contemporary society. Therefore, respondents were asked to state the various activities they use their mobile devices for. Their responses are summarised in Table 1 below.

Uses of mobile devices	**Responses**
Text messaging (SMS)	71 (80.7%)
Accessing the Internet (Browsing news, weather forecast updates, searching study materials)	81(92%)
Play games	54(61.4%)
Watch videos on YouTube	46(52.3%)
Instant Messaging (WhatsApp)	53(60.2%)
Record video and audio	47(53.4%)
View maps	52(59%)
Take photographs	53(60.2%)

Table 1: Use of mobile device

Besides the majority (92 percent) of the respondents using their mobile devices for accessing the internet, followed by text messaging (80.7 percent), playing games (61.4 percent), IM (60.2 percent), taking photographs and watching videos (60.2 percent), they also indicated that they used their mobile devices for:

a) Listening to music and radio
b) Storage of study materials and reading class notes
c) Accessing time of the day (act as a watch)
d) Conducting search for academic information and reading study materials
e) undertaking assignment and projects
f) Social Networking and socialising (Accessing Facebook, Twitter, Viber and Skype)
g) Accessing online examinations and e-book
h) For developing computer systems (programming) for example "my laptop"

4.2.2.3. Usefulness of Accessing Library Services through Mobile Devices

The rapid developments in mobile technologies have prompted libraries and librarians worldwide to leverage the power of these technologies to access information anytime and anywhere within this context. The respondents were asked to state their perception about the use of mobile devices for accessing library services and resources.

From the findings, it was clear that the majority of the respondents (98 percent) felt positive that the library should provide services and resources through mobile devices. However, 2 percent of the respondents felt that the library should not provide services through the mobile devices. They were asked to explain why they would not like to access library services through the mobile devices. Some of the reasons they gave were the following:

a) *"I don't enjoy reading on a small screen and also access to Internet is hard"*
b) *"Access to Internet is expensive"*
c) *"I prefer reading print resources" and*
d) *"Electricity is still a problem in our area"*

4.2.2.4. Library Services that can be Accessed through Mobile Devices

The research asked the 98 percent (86) respondents who preferred to access library services through mobile technologies to state which library services they would like to access by means of mobile device(s). A wide variety of services were listed with those most frequently mentioned (by an average of 64.4% responses) being the following:

a) Reference services
b) Subject guides
c) Searching the library Mobile Online Public Access Catalogue (MOPAC)
d) Access library news
e) Renew library items
f) Text messaging/notifications
g) Circulation services (e.g. inquire availability of information material, make reservations)
h) Quick response (QR)

i) Chat with a librarian
j) Mobile Website
k) View library map
l) E-resources (e.g. Databases and E-Books)
m) New library books notifications

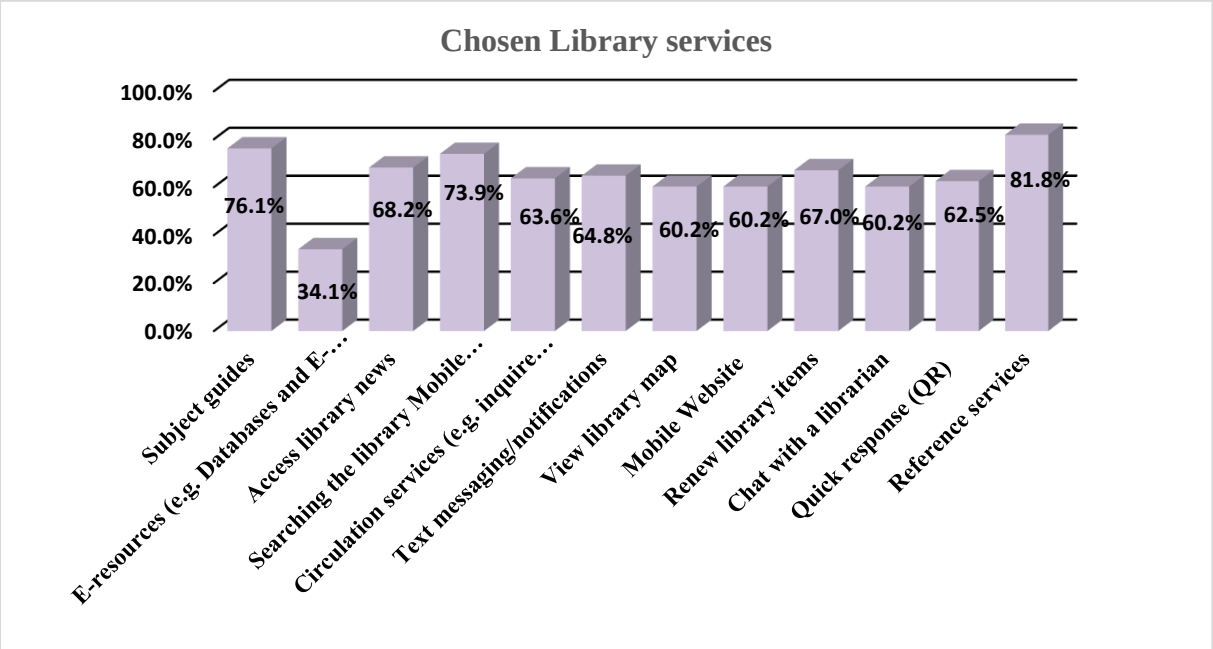


Figure 4.2: Library services via mobile.

4.2.2.5 Use of Kindle Fires Provided by the Muni University Library

The Muni University Library provides Kindle Fires to facilitate mobile access to the library resources and promote any mobile learning. This implies that students can move with their library in their hands.

Respondents were asked whether they actually use the Kindle Fires provided by the library. Although 19 (21.6 percent) of the students indicated that they do not use the Kindles, the majority of the respondents (78.4 percent), answered in the affirmative, indicating that the devises are popular.

4.2.3 Use of Social Media

The next section aimed at ascertaining the general use of social media tools and technologies by the respondents and their viewpoints with regard to the use of social media for library service delivery. Various issues were covered such as which social media tools are used frequently by respondent; the devices used for accessing social media; use of social media applications and tools in library service delivery; and their skills in accessing social media.

4.2.3.1. Personal Use of Social Media by Respondents

To understand the respondents' usage of social media, the study asked them to state whether they use or do not use social media. A total of 84 (95.5 percent) confirmed using social media while 4 (4.5 percent) stated that they do not use social media. The 4.5 percent respondents, who indicated that they were not using social media, were further asked to state the reasons why they were not using social media. Some of the reasons that they outlined included the following:

a) That social media is a source of distraction from studies. This is what some respondents stated in verbatim "*I don't have time for them because they are too many and distracts a lot, I need to concentrate on my studies"; […] "I don't just like it because of disturbances and distraction"*
b) Another respondent reported that social media is abused by many people and therefore there is limited privacy in the use of social media
c) Lack of skills in using social media was also another reason reported. The respondent said *"I don't have skills in using them. I am still learning how to use computers"*
d) Unreliable internet connectivity and high costs of accessing the internet was another reason reported to have limited the usage of social media by respondents.

4.2.4.2. Types of Social Media Applications and Tools Used

Respondents were asked to indicate which social media tools they use daily. The responses were as follows:

Facebook applications were the most widely used with 80 (90.9 per cent) responding to this category, followed by Facebook messenger 49 (55.7 per cent), WhatsApp (IM) 64 (72.7 per cent), Twitter 34 (38.6 per cent), YouTube 28 (31.8 per cent), and Flickr (Photo sharing) 12 (13.6%).

Other social media tools used by the respondents included RSS feeds 12 (13.6 percent); Blogs and wikis 12 (13.6 percent); Snapchat 7 (8.0 percent); and Del.icio.us 4 (4.5 percent). Some respondents also referred to their use of Wayn, LinkedIn, IMO, Instagram, Viber, Skype, and Hangouts.

4.2.4.3 The Frequency of Use of Social Media Applications and Tools

The 84 (95.5 percent) of respondents who indicated that they use social media were asked to state how often they used the various tools listed. Facebook was found to be most frequently (65 percent of the 84 respondents used Facebook daily). The other frequently used social media tools included Instant Messaging (WhatsApp) used by 41.25 percent of the respondents daily, Facebook Messenger was used by 40 percent daily, and YouTube was used daily by 15 percent of the respondents. Figure 4.3 below represents the overall responses.

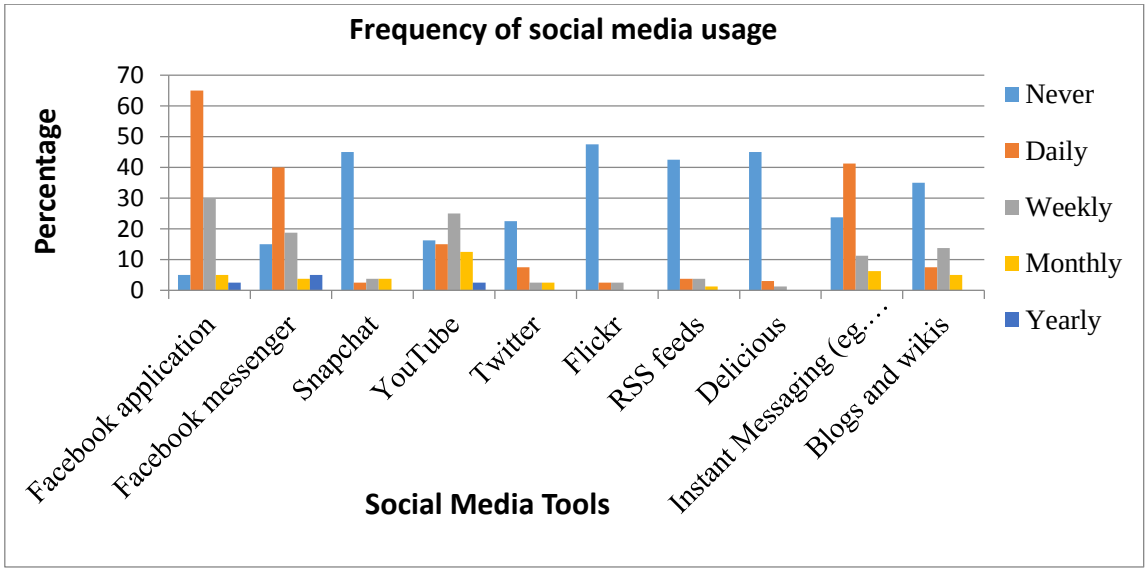


Figure 4.3: frequency of usage of social media applications and tools

4.2.4.4 Use of Mobile Devices for Accessing Social Media Tools and Applications

Respondents were asked to indicate whether they use their mobile devices for accessing social media. This was to find out whether there is convergence in the use of social media and mobile devices at Muni University. It was found that the majority of the respondents 84 (95.5 percent) use their mobile devices for accessing social media platforms whether through applications (apps) or via mobile browsers. Only 4 (4.5 percent) where not using mobile devices for accessing social media.

The study further asked those who do *not use* mobile devices for accessing social media to answer an open-ended question giving the reasons why they were not using their devices for accessing social media. Some of the reasons provided included:

a) Not having any social media account was stated by some of respondents, this was what the respondents said, "*I don't use social media"* […] "*I am not a fun of social media"* […] *"I don't own account in any social media tools"*
b) *Mobile devices screens are small and they would cause eye strain*
c) Another respondent also reported lack of mobile device with capabilities of connecting to the internet as limiting factor. The respondent specifically said, "*I don't have any smart mobile device that connects to the internet"*

4.2.4.5. Usefulness of Providing Library Services through Social Media

Respondents were asked to indicate whether they thought it was useful to provide library services through social media or not. This was intended to determine users' perceptions regarding the use of social media for provision of library resources and services since the library is already providing services via WhatsApp and Facebook.

A total of 80 (90.9 percent) of the 88 respondents said that it would be useful for the library to provide library resources and services via social media, while 8 (9.1 percent) indicated that the provision of library resources and services through social media was not useful and they did not agree with it.

In an open-ended question the 9.1% who said that providing library services and resources via social media was *not useful* where asked to provide reasons why they were not in agreement with this. The reasons they advanced included the following:

a) Social media tools are fit for entertainment and socialising but not academics, they may be subjected to abuse by irresponsible users. One respondents indicated that, *"[…] friends often disturb so you will not have chance to read because you will be replying to messages"*
b) Using social media requires skills in computing to effectively utilise them fully, users who are computer literate will face challenges in using social media. a respondent indicated that, *"It will not be useful to me, since I don't have skills in using them, may be in future and if usage regulated".*
c) Social media is more of chatting with friends than really acquiring knowledge
d) Social media is costly […] to use every day.
e) Social media is always flooded with too much information. Meaning it will be hard to separate right academic information from personal and entertainment information.

The 90.9 per cent, who indicated that the library *should* provide services and resources via social media, were asked to select which of the listed social media platforms they proposed the library should consider deploying for providing services and resources.

Their preferences from the most preferred to the least preferred social media tool were the following: Facebook application 66 (75.0%), Instant Messaging (WhatsApp) 53 (60.2%), YouTube 35 (39.8%), Facebook messenger 33 (37.5%), Blogs and wikis 18 (20.5%), Del.icio.us (Social Bookmarking) 8 (9.1%), Really Simple Syndication feeds (RSS) 6(6.8%), Twitter 5 (5.7%), Flickr (Photo sharing) 3(3.4%), Snapchat 1 (1.1%). From these findings, it is clear that Facebook and WhatsApp were the preferred applications whilst Snapchat and Flickr were unpopular as potential social media tools for provision of library services.

4.2.4.6. Abilities of Respondents in the Use of Social Media Applications and Tools

To effectively utilise social media, one needs skills in using social media effectively. The respondents were asked to rate their abilities in using social media applications and tools. Their self-reported expertise ratings are presented in Figure 4.4 below:

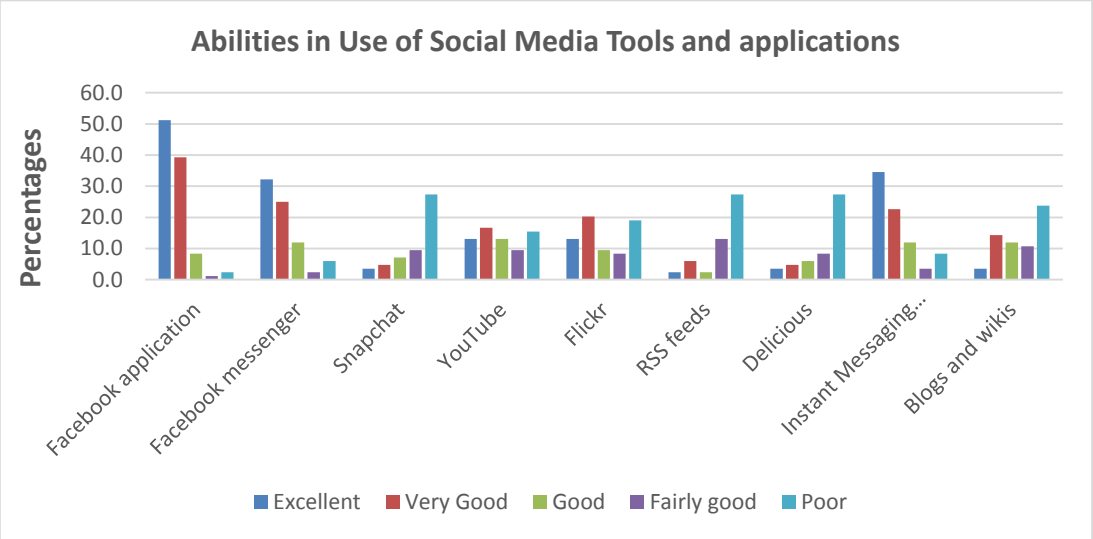


Figure 4.4: Abilities of respondents in the use of social media applications and tools

As can be seen, Facebook applications got the highest rating of excellent, whereas with one or two exceptions, responses point to the fact that the respondents feel they have very good or good abilities in utilising most of the social media tools and applications.

The next section discusses the findings from the staff interviews.

4.3. Findings from the Staff Interviews

Interviews were conducted with all four library staff as indicated in section 3.4.3 of this study. The four respondents that participated in the study are referred to as respondent A, respondent B, respondent C, and respondent D. The data was analysed according to the order of the questions that were developed for the interviews.

4.3.1 Biographical Information

First, the respondents were asked to provide information about their job title and length of period of employment at Muni University Library. This was done in order to contextualise their organizational knowledge and experience.

Most of the respondents have been employed at Muni University for less than five years. This is not a surprise since the University has been in existence for four (4) years.

The study further asked the respondents to indicate which library and information science (LIS) or related qualifications they held. All of the respondents had professional Library and Information Studies related qualifications. Two (2) respondents had a Diploma in Library in Studies, one (1) a Masters in Information technology (MIT) and finally one (1) with a PhD in Information Science. Respondent C upgraded from the Diploma level to Master's degree in Information Technology while respondent B progressed in and upgraded from Diploma level to PhD in Information Science.

4.3.2 Use of Mobile Devices

In this section, several questions were asked with regard to whether the respondents' owned any mobile device(s), which type of device(s) they owned, their opinions on the use of mobile devices for accessing library services and resources as well as the types of services they currently provide by means of mobile technologies.

4.3.2.1 Ownership of Mobile Devices

All four (4) of the respondents indicated that they had smart phones and two of them had both smartphones and laptops.

The respondents were also asked to state their opinions on the use or application of the mobile devices by library users. It was found that the respondents' observations were similar, stating that students used their mobile devices for various activities ranging from accessing online electronic learning resources from the internet, accessing emails, and social media tools and applications like Facebook, Twitter, LinkedIn, WhatsApp, as well as making phone calls. The interviewees all agreed that it was necessary that the library adopt appropriate mobile technologies as befits the status of a 21st Century library. This would also make their library meet the expectations of their users who actively access internet and social media through their mobile devices like smartphones and laptops.

4.3.2.2 Library Services and Resources Provided by Mobile Technologies

The interviewees were then requested to precisely indicate the kind of library services they were providing or intended to provide using mobile devices. These services and resources are discussed below.

Electronic Journals and Databases

The electronic resources were subscribed to jointly by the members of the Consortium of Uganda University Libraries (CUUL). Some of the e-resources provided mobile responsive content which can be accessed by mobile devices of any screen size. Some of these e-journals and databases that the university subscribed to containing mobile platforms (applications and mobile websites) include the following; EBSCOhost, Sage Online Journals, JSTOR and Oxford University Press Journals.

Mobile Library Webpage and the MOPAC

In addition to the electronic resources, the respondents also indicated that the library webpage (http://muni.ac.ug/lib/) which is hosted on the university website is also mobile compliant. According to the University Librarian, the webpage was under transformation into a library website which would also be mobile responsive. In addition to the mobile webpage, the library also had installed a MOPAC (Mobile Online Public Access Catalogue). The intention of developing these mobile tools as explained in the discussion of mobile electronic resources was for easy access by mobile devices. However, none of the respondents mentioned the development of library mobile applications (Apps) for accessing mobile library services.

Kindle Fire

The respondents further indicated that the library provided Kindle Fires loaded with e-books classified per subject that the students borrow to read at any location and anytime convenient to them. The closure of the library at night or weekend therefore does not affect the library users from accessing the library resources. The Kindle Fires have proved to be a vital device for the students who do not own laptops or any other device that connects to the internet. The borrowers, in addition to reading e-books from the Kindles, also use them to access and connect to the internet in places with wireless internet access points.

4.3.3 Use of social media tools and applications.

In this section, several questions were asked with regard to use of social media usage for provision of library services; their responses are presented in the following sub-sections:

4.3.3.1 Use of Mobile Devices to Access Social Media

The respondents were asked to indicate whether they use their mobile devices to access any social media tools and applications. The question was extended further by asking them (respondents) to also make a mention of which social media tools and application they access from their mobile devices, if they did access. This question aimed to determine the general feeling of how mobile technologies simplified access to social media.

It was found that all the respondents were using their mobile devices for accessing social media. According to their responses, the most commonly mentioned social media tool and applications they used were Facebook and Instant Messaging WhatsApp. These two social media platforms were mentioned by all the four respondents. However, three respondents separately indicated that they also used their mobile devices to access Twitter, Google+, LinkedIn and Wayn in addition to Facebook and WhatsApp.

4.3.3.2 Use of Social Media for Work-related Tasks

For the library to effectively utilise social media in the provision of library services and resources, librarians themselves must embrace and use technologies. In order to understand the librarians' use of social media at the Muni University Library, the respondents were asked to state whether they used the tools and applications for their day-to-day operations in the library and how they used them.

Three of respondents (A, C, and D) indicated that they used social media for their work related activities such as passing library announcements and news, and collaboration with colleagues especially discussing academic matters. It was only respondent B who did not use social media for professional work. The respondent claimed that social media was only good for personal social interactions, but not fit for professional or official tasks, which should be communicated through the university email.

4.3.3.3 Social Media Applications and Tools for Library Use

To understand the use of social media for library services and resources at the Muni University Library, it was deemed necessary to ask the respondents whether the library had social media presence and mention the social media tools used by the library.

All the respondents indicated that the library was actively utilising some social media tools in its operations. Facebook and the Instant Messaging tool (WhatsApp) were mentioned as the tools the library was already using in provision of services and resources.
The respondents were also given the opportunity to propose other social media tools and applications that the library was not using, but could consider utilising in the future for provision of social media based services. The respondents mentioned Google +, Twitter, and LinkedIn as the social media tools and applications that the library should adopt in provision of mobile based social media library services.

4.3.3.4 Skills and Abilities to Effectively Use Social Media

Effective utilisation of social media requires some set of skills and knowledge. In order to establish whether the respondents were effectively using social media, the respondents were asked to rate their skills in the use of social media tools and applications. Two out of four respondents indicated that they had no challenges in using social media as well as the basics of computer applications. While two of the respondents reported that they had less than adequate skills in using social media. They mentioned lack of knowledge on how to stop or minimise the mass amount of email notifications that distract them and also inadequate skills required to create accounts, manage and post content. One particular respondent said, "*I do not use them often; it means that my skills are not so high*".

4.3.4 Why Mobile and Social Media in the Library?

Respondents were asked to indicate the benefits that the library would get by providing mobile based social media services to their patrons. The responses are provided below.

a) All four respondents indicated that social media eases communication with library users. One-to-many communication has been made simple and instant by the power of social media.
b) Social media affords a simpler means of providing current awareness services
c) Library services such as reference and information services provided through social media save library users time and transport costs that they would have to incur travelling to the physical library.

4.3.5 Challenges to Implementing Mobile and Social Media Technologies

Despite the benefits and opportunities offered by mobile and social media technologies, some challenges do exist especially in developing countries. The librarians were asked to specify the challenges they face in using mobile and social media technologies. Their responses are as follows:

a) Unreliable internet connectivity at Muni University and the surrounding environment. Internet connections were reported to be either slow or unavailable where the respondents live. Likewise, one librarian (Respondent A) said that the process of procuring internet services at the University takes long because of the bureaucracy brought about by public procurement laws.

b) The library does not have a dedicated staff member responsible for managing mobile technologies such as social media. This has led to the "*challenge in creating content regularly*". The roles of such a person, according to the respondent, would be to update and collect relevant content from library staff and university management to be posted and communicated through the social media platforms.

c) Management of information over flow in social media was reported as a big challenge at personal level by respondent B. The respondent further stated that the excessive flow of notifications and information shared contributed sometimes to missing vital information shared on social media that is deleted or ignored.

d) Other challenges mentioned by the respondents included: Lack of adequate skills required to use the social media tools; lack of policies that guide the operation of

social media and mobile technologies at institutional level; and also unreliable electricity to power the mobile devices, library computing servers containing the information to be accessed from the mobile devices, and social media platforms.

4.3.6 Strategies for Implementing Mobile and Social Media Technologies in Libraries

In order for social media to thrive in any organisation, its management must promote, and create conducive environment for their use. To understand the Muni University Library promotional activities, the respondents were asked whether the library had a strategy for promoting the use of social media in the library.

Three respondents (B, C, and D) indicated that the library has specific promotional strategies for use of social media and other emerging technologies. Only one respondent (A) was not sure whether the library had such strategies.

The three respondents who affirmed that the library had strategy for promoting social media indicated that the library uses two strategies of promoting social media. The first is publicising the library social media platforms during library user education programmes. The second is by using the library policy which has a dedicated section discussing how the library would deploy emerging technologies like social media for provision of library services like reference service and also promoting them for communication.

Respondent A, who indicated that the library does not have a strategy for promotion of social media, clarified that promotional strategy of any technology should be guided by an independent social media policy which would in turn act as a tool for promotion of social media.

The librarians were further requested to propose strategies that could be employed by the library and university in general in order to benefit from the opportunities provided by emerging technologies.

Development of a Social Media Strategy

The respondents proposed the development of an independent social media strategy which should clearly state the goals for establishing online presence. This role should be for all

members of staff. There should be champions for the project, and a policy should be developed to guide the use of these tools.

Training to Bridge the Skills Gap

One of the main challenges mentioned as a hindrance to effective use of both mobile and social media technologies was lack of sufficient skills. The respondents suggested that to solve the problem of inadequate skills, continuous training on how to use of the tools and the creation of awareness of emerging social media and mobile technologies would lead to effective use of these technologies by librarians and library stakeholders.

Alternative Sources of Electricity

Alternatives sources for electricity, for example a solar system, would be a good long-term investment to mitigate the frequent power blackouts that are experienced at the University. A solar system is an ideal solution to an institution like Muni University, which is situated in an area with good climate having a mixture of both a rainy season and sunny weather fit for operation of solar systems. In addition, installing standby generators to supplement the thermal generator provided by the companies hired by the government, will contribute greatly in solving the power problem.

Acquiring a Reliable Source of Internet

There is need for Muni University to address the issue of internet connectivity by buying bigger bandwidth plus getting an alternative Internet Service Provider (ISP) so that one acts as backup to the main ISP.

4.4. Conclusion

This chapter has provided an analysis of the data obtained from students and staff at Muni University. The next chapter will present a discussion of the findings and proposed recommendations.

CHAPTER FIVE

DISCUSSION OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1. Introduction

Emerging technologies such as social media and mobile technologies are offering additional opportunities for students in higher institutions of learning to get access to learning content from anywhere and at any time. The mobility of these technologies is favoured by learners worldwide as opposed to the traditional methods of accessing education in a fixed physical space (Hlagala, 2015: 26). It is, *inter alia*, in the light of the above statement that this study aimed at investigating how the use of mobile technologies and social media can be used to enhance library service delivery at Muni University in Uganda.

This chapter provides a discussion of the key findings of the study as a reflection of the main research question and sub-questions, provided in relation to information found in the relevant literature covered in Chapter 2. The chapter concludes with recommendations for further actions by the Muni University Library, as well as recommended areas for further research.

5.2. Discussion of the Findings

5.2.1 Use of Mobile Technologies

The revolution of mobile technologies and their impact in society has made a mark in most operations of libraries and information centres today (Negi, 2014:14; Lombardo et al., 2012:15; Burford and Park, 2014:622). Emerging technologies such as social media together with mobile technologies have become vital alternatives to providing library resources and services in an era where libraries are facing challenges of budget cuts and the desire by the 21st century library users who prefer having library resources and services readily at hand (Caperon, 2015; Malathy and Kantha, 2013:361).

5.2.1.1 *Ownership of Mobile Devices*

The findings of the study indicated that the majority of the library users owned mobile devices with capabilities of accessing the internet. All the interviewed library staff also owned one or more mobile devices. The most commonly owned devices were smartphones and laptops. The respondents who did not own any of the devices listed in the questionnaire indicated that they would acquire the devices in future. This implies that mobile devices owned by Muni University Library users will increase in future when those who do not own the devices acquire them.

These findings are consistent with the findings of the Pew Research Center that found that 93 percent of Ugandans who attained higher school level education owned a mobile device (Pew Research Center, 2015). Mobile devices have become very popular today and owned by many students who use them as learning tools in today's education sector (Caperon, 2015).

5.2.1.2 Perceptions of Library Users on the Use of Mobile Devices in Academic Libraries

Library users and librarians agreed that mobile technologies are a valuable means of providing such services. Those respondents who indicated that the library should not provide services through the mobile devices were of the opinion that mobile devices were not fit to be used because of their small screen sizes and that batteries of some of the devices such as smart phones did not retain power for long.

The Muni University Library is already providing some of their library services using mobile technologies and social media, and although the majority of the respondents indicated that mobile technologies would be useful tools for providing services, users were not consulted before using the technologies. This assumption was that library users would embrace the technologies as has been the trend in other libraries in developed countries. The respondents urged that before introducing any new system or adopting any technology, the users or clients' opinion should be determined.

5.2.1.3 Uses of Mobile Devices

Responding to the question as to what mobile devices were used for, the respondents indicated that they used their devices for both personal and academic purposes including text messaging, playing games, taking photographs, and watching videos, as well as conducting searches for academic information and reading study materials, and Social Networking. These findings are consistent with those of Caperon (2015) and Tagoe and Abakah (2014: 99) that contemporary students in higher education prefer accessing educational information on their mobile devices because it is quick and efficient. Libraries and librarians need to take advantage of the devices to extend their services to the library users wherever they may be located.

The types of library services that respondents would like to use their devices for included access subject guides, Mobile Online Public Access Catalogue (MOPAC), Mobile Website, library map, and E-resources (e-books, e-journals and databases) mobile applications, and reference services/ chat with a librarian. The choices made by the Muni University Library users are supported by findings of studies by Johnson, et al. (2015: 18), Pietersen (2015:19), Negi (2014:15), Karim et al. (2006:39) and De Wee (2013:83), which show that librarians in developed countries loan mobile devices like tablets and e-readers, as well as developing mobile friendly catalogues, database applications (apps) and mobile websites.

5.2.1.4 Use of Kindle Fires Provided by the Library

The study found that the majority of library users borrowed and used the Kindle Fires provided by the library. The Kindles were used for reading e-books and accessing the University's learning system as well as connecting to the internet through wireless networks. These finding were supported by the library staff who indicated that the devices were widely used by the student population.

The wide use of the kindle fires and other e-readers by learners of the digital society was mentioned in the literature reviewed by Chuene et al. (2014:299), which show that e-readers were preferred because of their large storage capacity of at least 1,500 e-books, text-to-speech audio capability and convenience of accessing reading materials at any location.

The wide use of the Kindle Fires means that the library may have to acquire more Kindle Fires in addition to the current count of fifty in order to serve the increasing number of library users better.

5.2.2 Use of Social Media

As discussed in chapter two, social media has emerged as one of the fastest means of accessing information and sharing information instantly (Pietersen, 2015:94). These tools have also become popular in libraries and researchers are increasingly using them for sharing their research output (Boateng and Liu, 2014: 130).

5.2.2.1 *Use of Social Media by Respondents*

The study found that all the library staff interviewed and the majority of the university students use social media for both personal and academic work. The commonly used social media tools and applications by the respondents include Facebook application and Instant Messenger (WhatsApp), Twitter, YouTube, Flickr, Blogs and wikis, Snapchat, Del.icio.us, Wayn, Linkedin, IMO, Instagram, Viber, Skype, and Hangout

More than 90 percent of respondents said that it would be useful for the library to provide resources and services via social media. The remaining few respondents were of the opinion that social media tools and applications are suitable only for entertainment and socialising, but not for academic use since they are flooded with information, which is difficult to filter. A further reason advanced for not supporting the use of social media in providing library services was that effective usage of the technologies requires a set of skills which respondents indicated might be missing.

While the majority of the respondents for the use of social media by the library some indicated that they lacked the requisite skills in effectively using some of the tools and applications. This means that Muni University Librarians should provide training opportunities for the library users who lacked such skills.

5.2.2.2 *Social Media Tools and Applications to be Used by the Library*

Respondents suggested that the tools and applications preferred by the respondents included Facebook application and messenger, Instant Messaging (WhatsApp), YouTube, and Twitter. However, Snapchat, Flickr and RSS feeds were unpopular. This implies that the library has to start providing services using social media tools and applications that are popular to their users and also promote the unpopular relevant social media tools. The original choice of Facebook and WhatsApp by the Muni University Library for providing library services was a correct based on the observed popularity. These findings are similar to those of Baro et. al. (2014: 872), which showed that Facebook was the most popular social media tool used by librarians in Africa, followed by Twitter.

5.2.2.3 *Why Social Media-based Library Services?*

Based on the interviews with the librarians, social media eases communication with library users. It facilitates "one-to-many" communications instantly, saves time in answering reference questions, provides easy current awareness services, and overall saves time and effort.

5.2.2.4 Strategies for Implementing Mobile Social Media-based Library Services

The study proposes that for effective implementation of mobile and social media technologies, Muni University Libraries should develop a social media and other emerging technologies strategy, develop mobile device compliant content (mobile learning resources), and urge vendors of library e-journals and databases to develop mobile applications for their resources, develop training programs for both library users and library staff on how to use social media and mobile technologies for providing library services and resources. Also, the Management of the Library should consider recruiting staff that will be responsible for managing the library social media and mobile technologies platforms.

The next section, presents the recommendations to Muni University Library and other libraries intending to implement mobile technologies for social media based service delivery.

5.3. Recommendations

The findings presented here are similar to those of Kumar (2014: 475), which shows that contemporary library users own web-enabled mobile phones that are used for accessing internet and learning resources. The onus is on librarians and libraries to ready themselves to fully take advantage of these trending technological developments that are relevant to the operations of libraries and service-oriented businesses.

Based on the findings discussed in chapter four, and information found in the literature (covered in chapter two), the following recommendations are proposed for further action by the Muni University Library.

- Appoint a member of staff in the library specifically to manage social media, mobile and emerging technology. This person should be a champion of social media and mobile technologies use at the university, and participate in training of library users in the use of emerging technologies. Similarly, the Management Library should build the capacity of its staff in Continuous Professional Development (CPD) programmes to acquire new skills required in efficiently operating 21st Century libraries.

- Develop a policy and strategy pertaining to emerging technologies is vital. The policy will guide members on the use and infringement of privacy and other issues in the use of these technologies. An institutional strategy for these technologies will be a guiding document useful for promotion, evaluation, and assessment of these technologies for provision of library services and resources. This will all consequently contribute to the achievement of the library's mandate to support learning and teaching.

- Rigorously market the library's social media platforms to all library users.

- Increase the number of Kindle Fires to meet the growing number of library users.

- Train library users on effective use of social media and devices, such Kindles and other mobile devices.

- The library should take a leading role in working with faculty to promote the development of mobile device enabled academic content. This should be done concurrently with negotiations with library vendors for e-resources to develop mobile databases and mobile websites for the journals that the library subscribes to.

- The Management of the Library should improve the internet connectivity around the library by installing more wireless access points to solve the challenges associated with limited internet connectivity.

- Install a solar system in the library as an alternative to the unreliable electricity in the area so as to provide constant electricity for mobile devices.

For reliability of the results presented here, there is need to repeat the study with the academic staff of Muni University. Because of the rapid changes in the contemporary society, it is recommended that a similar study be conducted at the university in five years to keep abreast with technological trends for use in provision of library services and resources.

5.4 Conclusions

Contemporary library users are heavy consumers of social media. As such, many libraries in developed countries are using social media technologies and mobile services for providing library services and resources.

This study has shown that the Muni University Library is already offering mobile services and resources through WhatsApp and Facebook groups. This indicates that the library is moving in the right direction as it seeks to achieve its vision of being “a model library in provision of quality and ICT-based information for teaching, learning and research at Muni University”. However, there is still room for improvement for providing library services and resources through social media-based services and mobile technologies.

For Muni University Library to effectively use social media-based services and mobile technologies, the Management of the University Library should implement the recommendations of this study.

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APPENDIX A
QUESTIONNAIRE

Dear respondent,

My name is Bosco Apparatus Buruga, a student at the University of Pretoria pursuing a Master's Degree in Information Technology. As a requirement for this degree programme, I am conducting a research for a mini-dissertation which focuses on the use of mobile technologies for social media based service delivery at Muni University Library my work place. Kindly spend 10-15 minutes of your time to respond to this questionnaire. As a library user, your participation in this research will contribute in the development of strategies for utilisation of mobile technologies for social media based service delivery at Muni University Library.

The questionnaire is divided into three parts; Part 1 covers demographic information; Part 2 is on the use of mobile devices and Part 3 covers the practical application of social media.

As a policy at University of Pretoria, all information that you provide will be treated with confidentiality and your identity will not be revealed when the study results are reported. In order to ensure confidentiality of data gathered from the respondents, the researcher has obtained ethical clearance for this study from the Research Committee of the University of Pretoria.

Thank you very much for your participation and contribution towards this mini-dissertation.

INSTRUCTIONS:

Where applicable, please mark with a tick inside the box provided for your appropriate option or by adding information in the spaces provided with dotted lines.

PART 1
DEMOGRAPHIC INFORMATION

1.1 What is your current year of studies?

Second year [ ]

Third Year [ ]

1.2 Please indicate the programme of study that your enrolled and registered for e.g. ISM or ITM……

PART 2

USE OF MOBILE DEVICES

2.1 Do you own mobile device? (Smart mobile phone, iPad, Tablet, laptop, Kindle Fire, etc.).

Yes [ ]

No [ ]

If you answered **Yes** to the question, please go to question 2.3

If your answer is No, please answer question 2.2

2.2 Do you have any intention of acquiring mobile device?

Yes [ ]

No [ ]

If your answer is No, please explain why not?

.....

.....

.....

2.3 If your answer to question 2.1 was **Yes**, what mobile device (s) do you own? Please select all options applicable to you and also name others if not listed below.

Smart mobile phone [ ]

iPad [ ]

iPod touch [ ]

Tablet [ ]

Laptop [ ]

eBook reader (Kindle) [ ]

Others, please specify

……

……

……

2.4 Can any of your mobile device(s) access the Internet?

	Yes	**No**
Smart mobile phone	[ ]	[ ]
iPad	[ ]	[ ]
iPod touch	[ ]	[ ]
Tablet	[ ]	[ ]
Laptop	[ ]	[ ]
eBook reader (Kindle)	[ ]	[ ]

Others, please specify

……

……

……

2.5 What do you use your mobile device(s) for? Please select **all** the applicable options by ticking in the boxes and also name others if not listed below.

Make/receive calls	[ ]
Text messaging (SMS)	[ ]
Accessing the Internet	[ ]
Play games	[ ]
Watch videos on YouTube	[ ]
Instant Messaging (WhatsApp)	[ ]
Record video and audio	[ ]
View maps	[ ]
Take photographs	[ ]

Others, please list below

……

……

2.6 In your opinion, do you think it would be useful to provide library services through your mobile device (s)?

Yes [ ]
No [ ]

If your answer to question 2.6 is **Yes**, please answer question 2.7

If you answered **No**, please proceed to question 2.8

2.7 Which of the following library services would you like to access by means of your mobile device? Please select all the applicable options by ticking in the relevant boxes and also name others if not listed below.

Reference services [ ]
Quick response (QR) [ ]
Chat with a librarian [ ]
Renew library items [ ]
Mobile Website [ ]
View library map [ ]
Text messaging/notifications [ ]
Circulation services (e.g. inquire availability of information material, make reservations) [ ]
Searching the library Mobile Online Public Access Catalogue (MOPAC) [ ]
Access library news [ ]
E-resources (e.g. Databases and E-Books) [ ]
Subject guides [ ]
Others, please specify

……

……

2.8 If your answer to question 2.6 is No, please explain why you would not want to access library services by means of your mobile device.

……

……

……

2.9 Have you ever used the Kindle Fire supplied by the library?

Yes [ ]

No [ ]

PART 3

USE OF SOCIAL MEDIA FOR PROVISION OF LIBRARY SERVICES

3.1 Do you use social media?

Yes [ ]

No [ ]

If your answer is yes to this question, please proceed to question 3.2

If your answer to the question is No, please provide your reasons for not using social media

……

……

……

3.2 Do you use your mobile device to access any Social media tools and applications?

Yes [ ]

No [ ]

If your answer is No, please explain why not?

……

……

……

3.3 Which of the following Social media applications and tools do you use often? Please choose all options that are applicable and also name others if not listed below.

Facebook application	[ ]
Facebook messenger	[ ]
Snapchat	[ ]
WhatsApp	[ ]
Twitter	[ ]
Flickr (Photo sharing)	[ ]
YouTube	[ ]
Del.icio.us (Social Bookmarking)	[ ]
Really Simple Syndication feeds (RSS)	[ ]
Instant Messaging (IM)	[ ]
Blogs and wikis	[ ]

Other (please specify)

……

……

3.4 Use the table below to select by ticking the suitable column to specify how often you use Social media applications and tools

Social media applications and tools	**Never**	**Daily**	**Weekly**	**Monthly**	**Yearly**
Facebook application					
Facebook messenger					
Snapchat					
YouTube					
Twitter					
Flickr					
RSS feeds					
Del.icio.us					
Instant Messaging (eg. WhatsApp)					

Blogs and wikis					
Other (please specify) …… ……					

3.5 In your opinion, do you think it would be useful to provide library services through Social media applications and tools?

Yes [ ]

No [ ]

If your answer to question 3.5 is **Yes**, please answer question 3.6

If you answered No, please proceed to question 3.7

3.6 Which of the following social media applications and tools would you propose to be used to access resources and services at your library? Please choose the suitable options and also name others if not listed below.

Facebook application [ ]

Facebook messenger [ ]

Snapchat [ ]

YouTube [ ]

Twitter [ ]

Flickr (Photo sharing) [ ]

Really Simple Syndication feeds (RSS) [ ]

Del.icio.us (Social Bookmarking) [ ]

Instant Messaging (e.g. WhatsApp) [ ]

Blogs and wikis [ ]

Other (please specify)

……

……

3.7 If your answer to question 3.5 is No, please explain why you would not want to access library services through Social media applications and tools?

……

……

……

3.8 How do you rate your skills and abilities in using social media applications and tools? Please select by ticking the appropriate choice in the table below.

Social media applications and tools	**Excellent**	**Very good**	**Good**	**fairly good**	**Poor**
Facebook application					
Facebook messenger					
Snapchat					
Flickr (Photo sharing)					
YouTube (Video sharing)					
Twitter					
Really Simple Syndication feeds (RS					
Del.icio.us (Social Bookmarking)					
Instant Messaging (e.g. WhatsApp)					
Blogs and wikis					

Thank you for your time!

APPENDIX B
INTERVIEW GUIDE

CONTENT OF TEXT SENT VIA E-MAIL TO INTERVIEWEES

My name is Bosco A. Buruga, a student at the University of Pretoria pursuing a Master's Degree in Information Technology. As a requirement for this degree programme, I am conducting a research for a mini-dissertation which focuses on the use of mobile technologies for social media based service delivery at Muni University Library my work place. As you are responsible for provision of library services and resources at Muni University library you were identified as a resourceful respondent who would assist and inform me about the use of mobile technologies for social media based library service delivery.

I would like to seek your opinion about the following areas of the study:

- Use of mobile devices at Muni university library
- Use of social media for provision of library services
- Opportunities, challenges and strategies for implementation of mobile technologies and social media in libraries

I intend to use the information collected from the interviewees to improve the use of mobile technologies for social media based library services by librarians. I also hope that this research could be useful to other libraries and information institutions that are planning to implement mobile technologies and social media in libraries.

The scheduled interview will be on a one to one basis and last for 30 minutes. Please kindly identify a suitable timeslot for me to have an interaction with you between 3 August and 11 August 2016 at your office or any place convenient to you.

INTRODUCTION

I would like to take this opportunity to thank you for creating time for this discussion with me on issues related to use mobile technologies and social media for provision of library services. As explained in my email to you prior to this interview, I would like to discuss matters related to kinds of mobile devices and social media tools and applications used at Muni university library for provision of library services; opportunities, challenges and strategies for implementation of mobile technologies and social media in libraries.

In this interaction I will also offer you an opportunity to add any additional issues that that you feel are necessary for me to take note of in this study. This discussion will be recorded to help me in the data coding process. As policy at the University of Pretoria, the information you provide in the interview will be treated as confidential information.

QUESTIONS

SECTION A

BIOGRAPHICAL INFORMATION

1. What is your current job title?
2. For how long have you been an employee of Muni University Library?
3. What Library and Information Science or related qualifications do you hold?

SECTION B

USE OF MOBILE TECHNOLOGIES IN LIBRARIES

4. Do you own a mobile device? (Smart mobile phone, iPad, Tablet, laptop, Kindle Fires, etc.).
5. What are the common applications (use) of mobile devices by library patrons?
6. In your opinion, do you think it would be useful to provide library services through mobile technologies?
7. If your answer to question 6 is Yes or No, please can you explain why/why not?
8. What library services and resources (if any) are you currently providing through mobile technologies?

SECTION C

USE OF SOCIAL MEDIA TOOLS AND APPLICATIONS

9. Do you access social media through mobile devices? If yes, what social media sites do you use?
10. In your work related tasks, do you in any way use social media? If yes, please explain how.
11. Does your library provide library services and resources via Social media applications and tools?
12. Which social media applications and tools would you propose to be used to access resources and services in your library?

13. How do you rate your skills and abilities in using the social media applications and tools?
14. What do you see as the benefits of using social media for the provision of library services?
15. What do you see as possible challenges in developing and sustaining the use of mobile technologies and social media for library service provision?
16. Does your library have a social media promotion strategy?
17. Could you please provide some suggestions as to what you think should be covered by such a strategy?

CLOSING REMARKS

I thank you very much for participating in this interview, the information you provided is resourceful in my study and I look forward to using it for proposing effective and practical application of mobile technologies and social media in Muni University Library. In case of unclear issues that I will find from the information received in this interview, would it be in order for me to contact you?