ACCESS AND USE OF INFORMATION BY VISUALLY IMPAIRED STUDENTS AT THE UNIVERSITY OF RWANDA LIBRARIES

BY

UMUTESI ANNONCIATTE

A thesis submitted to the School of Information Sciences in partial fulfillment of the requirements for the Degree of Master of Science in Library and Information Studies, Department of Library, Records Management and Information Studies

MOI UNIVERSITY

ELDORET

2016

DECLARATION

DECLARATION BY THE CANDIDATE

This research thesis is my original work and has not been presented for examination in any study. No part of this work may be reproduced without prior permission of the author and/or Moi University.

……. ……

Umutesi Annonciatte Date

IS/MSC/LIS/29/13

DECLARATION BY SUPERVISORS

This research thesis has been submitted with our approval as University supervisors

Signature…… ……..…. Date ……

Mr. Amoth Duncan

Department of Library, Records

Management and Information Studies

Moi University, Eldoret

Signature……..… Date ……..…....…

Dr. Damaris Odero

Department of Library, Records

Management and Information Studies

Moi University, Eldoret

DEDICATION

To the soul of my Mother, the first to teach me.

To RUZIGANA Innocent's family, for care and support all the time.

and to my beloved son, NDOBA Kennedy Arnold with hope for bright future.

ABSTRACT

Access to knowledge and information is the key to socio-economic development in all countries around the world. It is therefore necessary for academic libraries to stock information materials that meet the needs of the visually impaired students. Recent study shows that less than 5% of information materials available to sighted library users are available to the visually impaired users. This means that more than 95% of information materials and sources available in libraries cannot be accessed by the visually impaired. The aim of the study was to investigate access and use of information for visually impaired students (VIS) at the University of Rwanda (UR) libraries with a view to develop strategies that can be used to improve access and use of information by these students. The objectives of the study were to: establish information sources available at the Libraries for the VIS, determine the extent to which VIS access and use information materials at the Libraries, examine the facilities and support system in place for VIS at UR, analyze the extent to which the needs of VIS at the UR Libraries are met, and identify the challenges experienced by VIS in accessing and using information at the UR Libraries. The study was based on universal design and access theory by Herriot. The study adopted descriptive research design. Purposive sampling was used to draw 26 lecturers and 8 library staff from a population of 520 lecturers and 31 library staff while a census approach was used in drawing the Visually Impaired Students totaling 28 and 3 deans of students from Huye Campus, College of Education (CE) Remera Campus and College of Business and Economics (CBE) Gikondo Campus. Data was collected using interviews for VIS, dean of students and lecturers and questionnaires for library staff. The findings show that there are no adequate Information sources at the University of Rwanda Libraries for the visually impaired students. It was also observed that the VIS have low levels of access and use of information materials at the University of Rwanda Libraries. Furthermore, the findings show that the three campuses of UR are deficient in the availability of library materials for the VIS. The study concludes that information needs for VIS are not met by the University of Rwanda Libraries. Finally the study concludes that students with visual impairments encounter specific challenges in the visual access and use of information, including: technical, institutional and personal issues. The study recommends the development and adoption of inclusive and universal services to VIS and suggests that UR libraries expand collection development policies for appropriate and diversified information resources.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

CAS - Current Awareness Service

CBE - College of Business and Economics

CE College of Education

CRPD - UN Convention on the Rights of Persons with Disabilities

DFID - Department for International Development

EFA - Education for All

EIFL - Electronic Information For Libraries

FOSS - Free and Open Source Software

ICT - Information Communication and Technologies

IFLA - International Federation of Library Association

ISP - Information Search Process

MDGs - Millennium Development Goals

SDI Selective Dissemination of Information

TPB - Theory of planned behaviour

TPM - Technological Protection Measures

UK - United Kingdom

UN - United Nations

UNESCO - United Nations Educational, Scientific and Cultural Organization

UR - University of Rwanda

UZ - University of Zimbabwe

VIS Visually Impaired Students

VMG - Virtual Magnifying Glass

WHO - World Health Organization

WIPO - World Intellectual Property Organization

ACKNOWLEDGEMENT

I am first and foremost indebted to Moi University for allowing me to undertake Master degree programme. I am obliged to register my sincere gratitude to my supervisors Mr. Duncan Amoth and Dr. Damaris Odero for their guidance, supports and constructive criticisms during the preparation of this project, as their wealth of knowledge, experience, immense wisdom and understanding contributed greatly to the success of this study.

My sincere gratitude goes to all lecturers of the School of Information Sciences and especially the Department of Library, Records Management and Information Studies for their constant encouragement and having faith in my potential.

I am equally grateful to the visually impaired students of University of Rwanda for the information provided. Many thanks go to all other people out there who in their special ways contributed towards the accomplishment of this work.

My deepest gratitude goes to the University of Rwanda for offering me sponsorship to realize my dream.

I am also indebted to my family for their wonderful support, encouragement, moral and spiritual support toward the study. Finally, honor and glory be to the Almighty God who gave me good health, wisdom, knowledge and hope in this study.

CHAPTER ONE

INTRODUCTION AND BACKGROUND INFORMATION

1.0 Introduction

The focus of this study is on students with visual impairments specifically at the University of Rwanda. University of Rwanda comprised of Huye Campus, College of Education (CE) Remera Campus and College of Business and Economics (CBE) Gikondo Campus, hereafter referred to as UR. Blindness and visual impairments are common in all countries of the world and Rwanda is no exception. Considerable changes in the education of people with impairments have led to an increase in their educational aspirations and thus an increasing number of visually impaired persons who wish to enter higher education.

According to Etheridge and Mason (1994) all people have the right to further education and training and that these must be available in ways that meet people's needs, regardless of gender, race, age and ability. This statement is also true of students with visual impairments and an impairment of sight does not remove that right. Lynch (1994: 42) concurs with this argument; a student with visual impairment is entitled to access to higher education not because of that physical impairment but because he or she is a person in his or her own right.

Those students who cannot use regular size print materials for purposes of reading are considered to have visual impairment. According to Ogba (2000), there are three categories of visual handicap: total blindness, low vision and partial sightedness. The

World Health Organization estimated that in 2002 more than 161 million people (about 2.6% of the world population) were visually impaired from which 37 million (about 0.6%) were blind and that 90% of blind people live in developing countries. Persons with visual impairment, however, they have a wide range of abilities as well as limitations. They may be able to read large print and may even move about without any mobility equipment in most situations, or sometimes they may be able to perceive light and darkness. Despite the peculiarities of their existence, visually handicapped persons remain integral members of society with information needs, which must not be overlooked (Nnadozie, 2006).

Service-provision to the visually impaired students in libraries refers to that specific professional assistance, purpose-suited media-formats and other resources provision and guidance given to them in the process of serving their needs in the library, particularly those meant to aid in satisfying their information needs. According to Ogba (2000), library services to the visually impaired students is a very important aspect of information services, and that the visually impaired students have long been denied opportunity in library service which no doubt would have been of immense help in their everyday living. She further avers that unlike people with sight, library services to the visually impaired transcend the everyday library services provided to people with sight to include a special care for them.

The library services are associated with the use of the relevant and functional educational media in enhancing teaching-learning activities for all user groups. The services include the use of information and communication technologies (ICTs) in serving the users.

Library services are essential services which cannot be overlooked in the educational aspirations of any individual. It is the repository for the society containing records for intellectual, cultural and social products. Unfortunately, in most developing countries, higher institutions of learning the provision of library services has been geared more towards the sighted than the visually impaired students. In the few cases that services are provided for the later, they are mainly found in schools and Universities.

To ensure customer satisfaction, library is required to conduct user studies which are investigations of the use and users (including non-users and potential uses and users) of documents, information, communication channels, information systems and information services.

According to Sridhar (1995), `Use' is the key purpose and `User' is the key and dynamic component of any library and information system. He further argues that a user study is a must at the time of designing a system or service. The efficient and effective operation of a library system or service also calls for periodic user studies. The effectiveness of a library and information system depends on the extent to which the system characteristics correspond with the users and in how many the potential users are willing and able to make use of it. User studies are also required not only to determine and confirm the general patterns of use of libraries but also to identify departures from the norms (in specific cases), even if it is only in small areas. User studies help to improve public relations of a library with its users and explain what librarians have found out by more indirect means. User studies, like market research, provide effective ground for marketing service products of libraries. By observing or questioning users, a systematic user study

helps to discover characteristics, information requirements (needs), behaviour, attitudes, opinions, priorities, preferences, and evaluations of users.

The visually impaired people are equally important part of our society and they have equal rights to get all information produced in the world, but they require special services and facilities to get information. The Visually Impaired students have the same information needs as that of sighted people but much information like digital information services are not available for them.

Previous studies have shown that access to libraries facilities for the visually-impaired are merely a microcosm of the outside world. This has been confirmed by the work of Bagandanshwa (1998), who stated that library services for the visually-impaired in Tanzania are very poor, to the point of being almost non-existent. However, this discrimination does not only exist at the level of day to day interaction, but also at the planning stage, as shown by Ndumbaro (2009), who argues that library services do not take the needs of the visually-impaired into consideration during planning. On the basis of this idea, researcher conducted this study to identify the information needs of the Visually Impaired students of the University of Rwanda and facilities available to them to access this information in the university libraries.

1.1 University of Rwanda

The University of Rwanda was established by law on the 10th of September, 2013, through the amalgamation of seven institutions of higher learning into single university consisting of six self-governing colleges, namely the College of Arts and Social Sciences

(CASS) based at Huye Campus with some programs at Nyarugenge Campus, the College of Agriculture, Animal Sciences and Veterinary Medicine (CAVM) based at Busogo Campus with some programs at Rubirizi and Huye Campuses, the College of Business and Economics (CBE) based at Gikondo Campus with some programs at Rusizi and Huye Campuses , the College of Education (CE) based at Remera Campus with some programs at Rukara and Kavumu Campus, the College of Medicine and Health Sciences (CMHS) based at Nyarugenge Campus with some programs at Kicukiro, Nyagatare, Nyamishaba, Kibungo and Huye Campuses and the College of Science and Technology (CST) based at Nyarugenge Campus with some programs at Huye and Nyagatare Campuses (Rutayisire, 2013).

The University of Rwanda is administered by the Board of Governors and the Senate, with representatives from the staff and students, and the Vice Chancellor who is the Chief Executive Officer of the University, and who is assisted by 2 Deputy Vice Chancellors and 6 College Principals. The titular head of the University is the Chancellor (MacGregor, 2014).

The University of Rwanda currently does not have a single main library. Instead, the library consists of the libraries of the self governing colleges and Campuses. The Huye Campus library was built in 1963, and extended in 1968 and 1978, with the latest extension covering a space of 2535m2. The Huye Campus Library is divided into three main departments, namely the Internal Services Department, which deals with acquisitions, cataloguing and classification, the External Services Department, which is concerned with periodicals, circulation, the reference section and the Rwandan collection.

The Information and Communication Technology (ICT) Department coordinates and supports the other two departments, through a help desk, web site development and database management. It is also expected to play a significant role in the provision of accessible information formats for the visually-impaired (Kwibuka, 2013).

The Huye Campus Library has a collection of 150 000 books, and it subscribes to 28 printed journal titles and 33 000 e-journals. The Huye Campus Library also provides free access to online resources such as Open J-Gate, Pinakes and so on. It has 16 members of staff and it can accommodate a visually-impaired population of 9 students (Rutayisire, 2013).

Another library in the University of Rwanda is the College of Business and Economics Library Gikondo Campus (UR-CBE Campus Library). It currently has 17 000 print volumes and over 60 databases and e-books. The main services provided within this library are technical processing of information resources, library and reference service, acquisition of theses, document delivery and reprographic services, and an online search service. It has 8 staff, equipped to serve a target population of 6 visually-impaired students.

The third library in the University of Rwanda is at the College of Education Remera Campus, which was formerly the Kigali Institute of Education. It is also referred to as the CE Remera Campus Library. It contains 74 159 books representing 18 054 titles, and it has access to over 50 databases and 100 e-books. The collection is constantly updated to meet the research requirements of students. The CE Remera Campus Library uses

Alexandria Library Management System Software to manage its collection, and it also has an OPAC (Online Public Access Catalogue) which allows used to navigate external resources by using the library IP address to log in to the catalogue. The CE Remera Campus Library offers similar services to the UR-CBE Gikondo Campus Library, and it has a staff of 7, and it serves a target population of 13 visually impaired students (Official Gazette of the Republic of Rwanda, 2013).

Cumulatively, the University of Rwanda Library consists of 241 159 printed books, and thousands of electronic resources available online, managed by 68 staff for 28 visually-impaired students, as well as thousands of others. Converting its resources, especially the printed ones, into formats accessible to the visually-impaired will be a herculean task, but hopefully this can be achieved with the aid of information technology. This is necessary in order to eliminate the educational marginalization and exclusion that many Rwandan people with disabilities currently face (EENET, 2003).

This is in line with the Rwandan Constitution (Republic of Rwanda, 2003), which aims to fulfill the goal of providing equal opportunities to citizens with disabilities. This has been confirmed by policy documents in Rwanda, which reiterate that education is a fundamental right for all citizens, including citizens with disabilities, and that education is the means for them to achieve their full potential and to contribute to nation building, regardless of their gender, background and disability.

Rwanda's goals for its disabled citizens are in full recognition that persons with disabilities “have long-term physical, mental, intellectual or sensory impairments which

in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" as stated in Article 1 of the UN Convention on the Rights of Persons with Disabilities (2006). Thus the Government of Rwanda is committed to ensuring that disability should not be a barrier to the full development of a disabled person.

Although it has been shown that discrimination against people with disabilities persists in all societies (Charlton, 2000), this is no reason for authorities to sit back and allow disabled persons to continue to suffer. As a result, nations are increasingly adopting and reinforcing anti-discriminatory policy and education reforms to eliminate marginalizing attitudes such as racism, sexism, prejudice against the disabled (UNESCO, 2005).

1.2 Statement of the Problem

Friend (2009) observes that less than 5% of information materials available to sighted library users are available to the visually impaired users. This means that more than 95% of information materials and sources available in libraries cannot be accessed by the visually impaired depriving them of prerequisite information they may need.

Although The University of Rwanda enrolls visually impaired students, its campus libraries lacks sufficient information resources appropriate for these category of users. Braille, talking books and specialized web based information resources are inadequate. Even for the few resources available, the visually impaired students often are challenged to use them as the libraries have not created adequate awareness and training on the use to these resources particularly considering their use require special equipment. This raises

fundamental concerns of the level of access and use of the library resources by the visual handicapped. Without adequate understanding of the challenges this group of users face, or their special needs, the library cannot customize their services to meet their needs.

1.3 Aim of the Study

The aim of the study was to investigate access and use of information by visually impaired students at the University of Rwanda Libraries with a view to develop strategies that can be used to improve access and use of information by visually impaired students at the University of Rwanda.

1.4 Objectives of the Study

The following objectives guided the study:

1. To establish information sources available at the University of Rwanda Libraries for the visually impaired students.
2. To determine the extent to which visually impaired students access and use information materials at the University of Rwanda Libraries.
3. To examine the facilities and support system in place for visually impaired students at the University of Rwanda.
4. Analyze the extent to which the needs of visually impaired students at the University of Rwanda Libraries are met.
5. To identify the challenges experienced by visually impaired students in accessing and using information at the University of Rwanda Libraries.

1.5 Research Questions

In order to address the research objectives, the study was guided by the following research questions:

1. Which information resources are available at the University of Rwanda Libraries for the visually impaired students?
2. How do the visually impaired students access and use information materials at the University of Rwanda Libraries?
3. What are the facilities and support system in place for visually impaired students at the University of Rwanda?
4. Are the information needs of visually impaired students met?
5. What are the challenges experienced by visually impaired students in accessing and using information at the University of Rwanda Libraries?

1.6 Assumption of the Study

- Access and use of library information resources by Visually Handicap students at UR is largely hampered by the absence of specialized information resources and equipment.

1.7 Significance of the Study

The pool of literature about the access and use of information for visually impaired students is growing (Rose and Meyer, 2002). This is the first empirical study of its kind to evaluate the access and use of information by visually impaired students at the University of Rwanda.

As enrollment increases in colleges and post secondary institutions, a wide diversity in population will be encountered by all students. Among the diverse population will be individuals that have disabilities, including visual impairments and these students learn in the same environment as their colleagues with normal sight.

The study will provide data for policy formulation to the administrators of the University of Rwanda Campuses that are established to meet the information needs of the visually impaired students in Rwanda with reference to the improvement on quality and effectiveness of such information service in the various institutions. This research study will enable readers to recognize how people with visual impairments access and use information in libraries. In this way, it will be possible to gain a better understanding of the benefits and the challenges that those with visual impairments encounter as they access and use information in the libraries.

This research study has the potential to offer insight about people who have visual impairments access and use of information in libraries might play in the future. The results from this study will be useful in helping to advocate for awareness and change in the provision of library and information service.

The results of this study will have applicability to other situations. Research is not a quest for objective generalizations (Rossman & Rallis, 1998) but rather searching for understanding and meaning. This study does not claim to be generalizable in the statistical sense but can be useful in other situations. Students with visual impairments may encounter obstacles that other groups of people also experience. The study will shed

light on challenges that also face students with good visual acuity or who may have other disabilities.

This study will provide valuable information for librarians, visually-impaired students, sighted students, university lecturers and administrators, which will help them to understand the problems faced by visually-impaired students in accessing information from libraries under existing circumstances, and to find ways in which libraries can be made more effective in delivering information to the visually-impaired, and how the entire library user experience can be made more inclusive and enriching for visually-impaired students. This study might also give insight and new ideas for students with visual impairments in type of visual impairment or environments other than the specific experiences with the University of Rwanda libraries setting that is described. Readers will form images from the study and then be able to compare specifics to their own settings. This study is significant because it will contribute to the ongoing literature and provide a deeper insight for future research in the area of access and use of information for visually impaired students in academic libraries.

1.8 Scope of the Study

This study focuses on library services provision for students with visual impairments with regard to the layout of library buildings and access to information resources. The study addresses students who are partially sighted or totally blind. The geographic scope of the study was limited to Rwanda, covering University of Rwanda three campuses i.e. Huye Campus, College of Education (CE) Remera Campus and College of Business and Economics (CBE) Gikondo Campus. The University of Rwanda campus libraries are

largest libraries in Rwanda and serves more than 15,000 users comprising academic and and administrative staff, researchers and students. It also assists a significant number of local users, ministries, research institutes and other institutions of higher learning, as well as regional and international researchers (Facts & Figures (2015).

The research area was limited to various departments within University of Rwanda which includes: library staff, Campus deans of students, lecturers and visually impaired Students that cut across the three campuses. The choice of these academic libraries was based on the fact that together they represent other college libraries which provide information services to higher proportion of the visually impaired students in University of Rwanda. Hence, the result will not be generalized but its findings would be placed in the relevant context of the individual institution studied.

1.9 Limitations of the Study

Current literature on access and use of information by visually impaired students in academic libraries in Rwanda as a whole is scarce. Therefore this study relied on literature existing in other counties.

It was also with difficulty and a lot of effort in getting back the questionnaire that was given to the respondent staff. The average University of Rwanda worker in the three campuses is always busy and excuses such as “I am busy” and I don’t have time” as some of the comments from the respondents. Another area of limitation to this study came from the inability of respondents to complete and submit questionnaire on time for data to be analyzed. Despite these limitations, several reminders and all the appropriate scientific

approaches were undertaken by the researcher to ensure that the confidence levels of the sampled are high enough and were implemented.

1.10 Definitions of Operational Terms

Access - Applied to delivery, instructions, methods; with electronic resources, ensuring the proper technological software, hardware, and internet connections, as well as providing user instructions on how to use effectively these materials, are a key part in the role of access to electronic resources.

Disability tools: There are a many FOSS tools which can be used to support library users with disabilities. These include tools to aid viewing of the screen (such as magnification, colour change), tools to aid usability (e.g. making the cursor more visible), tools to aid reading (e.g. text-to-speech tools in many languages), information presentation tools (e.g. mind mapping software) and more.

Information need: This is an individual or group's desire to locate and obtain Information to satisfy a conscious or unconscious need. Information seeking is undertaken to identify a message that satisfies a perceived need.

Information seeking behaviour: Information seeking behavior refers to the way people search for and utilize information.

Legally blind: Indicates that a person has less than 20/200 vision in the better eye or a limited field of vision (20 degrees at its widest point) (NFB, NICHCY website)

Low vision: Vision loss (20/70 or worse) that cannot be corrected by ordinary glasses, contact lenses, medication or surgery.

Totally blind: Students without vision who learn via Braille or other non-visual methods (NICHCY website).

Virtual Magnifying Glass: A screen magnification tool that allows users to simply place a virtual magnifier over any item on the screen to enlarge it. The user can determine the shape and size of the magnified area and the strength of the magnification, using either the mouse or the keyboard.

Visual impairment: This refers to functional vision loss, not a specific eye disease. Visual impairment includes low vision as well as blindness. The definitions of visual impairment used for this study follow the categories of the International Classification of Diseases Update and Revision 2006 that defines impairment according to presenting vision (www.who.int/classifications/icd/2006updates).

1.11 Chapter Summary

The chapter covered background information to the study, an overview on access and use of information by visually impaired students at the University of Rwanda libraries. It also present background information on University of Rwanda library services, statement of the problem, aim and objectives, research questions, assumption of the study, significance of the study, and finally scope and limitations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The literature review examines the scholarly literature that is relevant to the research topic. This includes findings from diverse studies on the access and use of information by visually impaired students at university libraries; although it also incorporates findings from studies (mostly in developed countries) in which visually impaired people have access to public libraries. The findings were sources from books, journals, articles, periodicals, abstracts, and legislative documents, among others.

2.1 Theoretical Framework

This study is concerned with service-provision, accessibility and use of information as determinants of library use and user-satisfaction among visually impaired students in the University of Rwanda Libraries. A significant element of the study is the unrestricted access to all library services for visually impaired students.

There are several theories related to the access and use of information in the libraries that have been developed by various scholars and librarianship theorists. Such theories include but not limited to:

- Information behavior theory
- Universal design and access theory

2.1.1 Information Behaviour Theory

Information behaviour is highly research topic within the field of library and information studies, and many models and theories have been explored to explain the ways that individual seek and use information in a range of contexts (Wilson, 1999). Information seeking behaviour arises as a consequence of a need perceived by the information user, who in order to satisfy it, makes demands upon formal or informal information sources or services, resulting in either success or failure to satisfy that need (Wilson 1999: 251). The Wilson (1999) information behaviour theory looks at the need to explore information seeking in context and allows people to be conceptualized as individuals and as socially constructed entities, which is appropriate in the context of the theory in the disability field. Wilson has developed various models of information behaviour over a period of time, for example from 1981 to 1999. Wilson's 1999 theory allows a description of an explanation for information behaviour. Dick (2006) has emphasized the need for the use of models that take a wider view of the social contexts of information behaviour given the history, economic and societal context. It has also been used in South Africa in a study of information behaviour in a health context (Fourie 2010). Further adaptation of the model has been considered by the researcher. This study should establish the validity of the adaptation. Proponents of this theory demonstrates that part of the information seeking behaviour may involve other people through information exchange and that information perceived as useful may be passed to other people, as well as being used (or instead of being used) by the person himself or herself. Wilson (1999) also developed a useful theory in which person in context is the focus of the information needs. He identified information seeking behaviour as a users' interaction with the findings of the information

seeking activity. Therefore, the theory is not suitable for this study because information behaviour models for example, indicate that various factors influence specific information needs. This theory views portrays information seeking behaviour arising as a consequence of needs. There is gap in the model due to indeterminacy of human needs.

2.1.2 Universal Design and Access Theory

The current study was based on the universal design and access theories. Universal design (often inclusive design) refers to broad-spectrum ideas meant to produce buildings, products and environments that are inherently accessible to older people, people without disabilities, and people with disabilities. The term "universal design" was coined by the architect Ronald to describe the concept of designing all products and the built environment to be aesthetic and usable to the greatest extent possible by everyone, regardless of their age, ability, or status in life (Ronald, 1963).

Universal design emerged from slightly earlier barrier-free concepts, the broader accessibility movement, and adaptive and assistive technology and also seeks to blend aesthetics into these core considerations. As life expectancy rises and modern medicine increases the survival rate of those with significant injuries, illnesses, and birth defects, there is a growing interest in universal design. There are many industries in which universal design is having strong market penetration but there are many others in which it has not yet been adapted to any great extent. Universal design is also being applied to the design of technology, instruction, services, and other products and environments (Paul, 2013).

Herriot (2006) established a set of seven principles which describe characteristics required to make designs for libraries universally accessible. These include: simple and intuitive use, flexibility in use, low physical effort, perceptible information, tolerance for error, equitable use, and size and space for approach and use. Each principle above is succinctly defined and contains a few brief guidelines Principles of Universal Design Version 2.0 (1997) that can be applied to design processes in any realm: physical or digital. These principles are broader than those of accessible design and barrier-free design.

The aforementioned characteristics identified by (Herriot, 2006) are not only designed to be accessible for the visually impaired, but also for persons with other disabilities. For instance, the characteristics pertaining to size and space for approach and use, and low physical effort, can also apply to wheelchair users. Thus, the principles enumerated by Herriot (2006) are designed to make libraries accessible by everyone, regardless of the type of disability that may affect them.

Therefore, it is readily apparent that the universal design approach is a broad-based, inclusive system for providing an egalitarian, non-discriminatory library service, which addresses the needs of all library patrons, regardless of physical disability. The universal design and access theory focuses on the independent variable in the study – namely access and use of information. The theory is predicated on the principle that from inception, the library considers the provision of the level of services that effectively meets the needs of persons with visual impairments. Universality, as proposed by the

theory, thus calls for a library service that is flexible enough to cater to the varied requirements of all users, and has a substantial tolerance for error from all users, particularly from visually impaired persons. It is on meeting the aforementioned criteria that the library service can be considered to be equitable.

The accessibility requirements of visually impaired persons, however, are different from those who are otherwise disabled. For instance, wheelchair users may face problems in accessing certain areas of the library, but once they are in these areas and have got the books they face no further problems in reading them. With the visually impaired, however, the problem is not so much physical access to the library as it is reading the content in books, which must be put into a suitable format (Braille or audio books) to enable the visually impaired to read it (Maduagwu and Ojewande, 2006).

The foregoing is closely related to the characteristics of simple and intuitive use and perceptible information. The provision of information to visually impaired persons is only possible with the appropriate formats. In the absence of accessible formats, the visually impaired often have to make do with unreliable measures such as human readers, who may not be as reliable as technological formats. Indeed, the literature reviews which show that when library layout suitable for the needs of the visually impaired persons are used, their acquisition of information becomes faster, easier and generally more intuitive because their sense adaptation, as a result of loss of sight, is tailored towards the perception of information through alternative formats to print, such as through sound (readers and audio books) and by touch (Braille).

The characteristics of equitable use, flexibility in use, low physical effort, size and space for approach and use address the aspect of accessibility. Accessibility to the resources, equipment and locations within the library housing needed resources and/or services must be guaranteed for visually impaired persons. Thus equitable use means that all of the volumes in the library should be available in print form as well as in formats accessible to the visually impaired (audio and Braille). Flexibility is also provided by a multiplicity of formats, allowing the visually impaired to switch from one format to another. Low physical effort, size and space should address the needs of the visually impaired in terms of motion, such as providing hand rails, sufficient space for white cane users to manoeuvre, or allowing access by guide dogs. Signs can also be put up in Braille to enhance access. This is because the right of the visually impaired to have unrestricted access to any necessary service or resource must be upheld in the provisions made by the library, in order to ensure that the principle of universality is enforced.

Universal design is concerned with meeting the needs of people with disabilities. By proceeding from a focus on creating a design for a wide range of users, taking into account physical disability, the overall usability of an environment (such as a library) can be increased without needlessly multiplying costs. The universal design approach, implemented from the very beginning, such as when the library is initially constructed, also gets rid of the need for design modifications later when either abilities or circumstances change, thereby also saving on costs. Furthermore, a universal design approach avoids the disadvantages of implementing segregated accessibility features that are often viewed as “special”, and thus exceptions to the norm, which are typically more

expensive and usually not aesthetically pleasing. Within library facilities, adopting a universal design approach allows for the greatest level of flexibility and long-term cost effectiveness. With the foregoing in mind, the researcher proposes that the universal design and access theory is suitable for the current study and therefore intends to use it as the basis for making empirical deductions.

2.2 Empirical Review

2.2.1 Available Information Sources for Visually Impaired Students

Visually impaired persons often face difficulties in accessing information which most sighted people take for granted. However, Machell (1996) states that the current level of information provision and access in libraries leaves a lot to be desired: "The ideal library service is one where each individual, regardless of the degree of visual impairment, has access to the materials and information at the time they are required, in a format that can be used, in the quantities that are needed, and where the needs of the user are understood by the staff." Although libraries, especially university libraries, have taken steps to improve access for the visually-impaired, they still do not access information as easily as a sighted person would.

The sources of information that is usually available to blind people and the visually impaired are Braille, Audio-Books and large print books produced and provided by specialized libraries for the blind. However, new technologies have opened up new areas of reading, participation and activities for people with disabilities that were inaccessible only a few years ago. Consequently, the visually impaired now have access to computer

programs, the internet and digital resources using Braille displays, screen magnifying monitors, screen magnification, scanning software, screen readers and speech synthesis. These electronic aids are named Assistive or Adaptive Technology (Payne and Singh, 2010). Although this new technology opens up vast opportunities for the visually impaired, they require a high level of skill to operate. Thus, for the visually impaired to fully utilize these technologies, university libraries should provide adequate levels of assistance or orientation training on their use.

Previously, before the implementation of computer technology to assist the visually impaired, it was reported that the blind and visually impaired relied heavily on family members and friends as sources of information. Thus there was a hierarchy of information in which interpersonal sources of information were at the top (Tinker, 1993) followed by media sources such as newspapers, television and radio. According to the authors, libraries were less frequently used to get information, and on the rare occasions when libraries were used, direct contact with the librarian was preferred. This was confirmed by Balini (2000), whose survey at the University of Alberta (Canada) on the information needs of blind and visually impaired citizens in the province of Alberta revealed that the majority of the focus group used their public library because they preferred to receive personal services such as "speaking directly with a librarian, and leaving with a book in hand". However, Balini (2000) did not specify whether the books referred to were audio-books or large print books.

University libraries have to promote inclusive access to information for the visually impaired because there are usually not enough resources to set up separate libraries for

the blind, and even if such libraries could be set up, they would tend to marginalize the visually-impaired. This has been confirmed by studies showing that libraries for the blind even in relatively developed and prosperous nations suffer a disparity compared to public libraries. Most of them provide access to less than 5% of the materials published in their country. For the foregoing reasons, it is crucial to adapt existing university library services to accommodate the visually-impaired, as separate libraries for the blind are inadequate to meet the demand for information.

Such an initiative has been implemented in the United States. According to the American Foundation for the Blind (2013), cooperation through the use of technology provides for innovative opportunities to the visually impaired. This has been done through a partnership by US state libraries for the blind in five states together with the National Library Service for the Blind (NLS) and the Library of Congress. Collectively they have launched a digital audio book service for visually impaired users. The system enables blind readers to download digital audio books directly to their computers (NLS, 2005). Such an initiative broadens the scope of access to information for the visually impaired, without creating costly, additional structures.

According to Tank (2000), "The libraries for the blind should take upon themselves the role of inspirer, lobbyist and watchdog. In Denmark we assume that role primarily towards other public libraries but also towards commercial information vendors, who develop and sell library systems". However, in the countries world, where separate libraries for the visually-impaired have not been established, existing libraries, including

university libraries, should take the initiative to reach out to the visually impaired, as in many instances there is no network of libraries for the blind to lobby on their behalf.

The importance of such cooperation has been underscored by the IFLA guidelines for libraries for the Blind (IFLA, 2005), which state: "Blind and print disabled people require access to public library type services for the general blind public in their communities which also interfaces with other types of libraries such as school or academic libraries. The roles of these community based library services should be developed in co-operation with other national and local agencies. The community based public library, for example, has the best opportunity to become a major access point for all print-disabled readers. All libraries should ensure that their collections and services complement and integrate with national agencies to provide access to as wide a range of materials and services as possible" (IFLA, 2005). However, community based public libraries are often funded by the state, and so are beyond the reach of university libraries. Nevertheless, university libraries can take a bold step from learning from the best practice developed by public libraries in the developed world, and apply these lessons to improving access and use of information for the visually impaired.

As mentioned above, among the earlier formats used by the visually-impaired to access information are Audio Books, CD-ROMS, Braille and large print books, which occupy a significant part of the services of public libraries. However, Tape Audio Books are not user friendly as book marking and navigation is slow and cumbersome, which is why they have been rendered obsolete. One format that is expected to replace them is DAISY Books (Digital Audio Based Information System) which is an international standard for

digital books which are distributed on CD-ROM. It has proved to be a very useful tool for visually impaired. According to Goddard (2004), a growing number of libraries are producing and providing Daisy books that is coming to be recognized all over the world as a major opportunity for the future. Inevitably, there are still some teething problems with Daisy. In the Netherlands, where audio-cassette system has been abandoned, users have some problems in using Daisy as the CD-ROMs requested are often faulty (De Witt, 2004). However universal standards are strongly recommended by Kavanagh (2005), who states:

"Many libraries for the Blind originated outside mainstream libraries, primarily as a transcription service in blindness organizations. Standards are seen as a luxury to be ignored. However without standards libraries cannot record, retrieve and share content as part of a wider network or family of libraries. Libraries unable to implement agreed upon standards are excluding themselves from best content and from developing interconnected digital libraries of the future".

In response to this concern, a number of organizations have sprung up to promote widely accessible formats for the visually-impaired. One such organization is Electronic Information for Libraries (EIFL), which is based in Europe, and is an international not-for-profit organization working in collaboration with libraries in more than 60 developing and transition countries in Africa, Asia, Europe, and Latin America. EIFL enables access to knowledge for education, learning, research, and sustainable community development (http://www.eifl.net/). Thus, although its wider mandate is to provide electronic

information for libraries, it also provides electronic information that is specifically targeted at visually-impaired users.

An example of a library that has benefited from the electronic resources provided by EIFL is the University of Zimbabwe (UZ) which is located in the country's capital city, Harare, and whose library serves more than 12,000 students and staff. It has fully embraced information communication technologies (ICT) to maximize access to information resources in support of teaching, learning, and research (Payne and Singh, 2010).

When UZ librarians realized that their online services had not been adapted to meet the needs of their visually impaired students, they had an option of using the limited number of commercial tools within the library for visually impaired users, but these software tools are proprietary and could not be shared widely due to the prohibitive costs. The UZ library therefore chose to explore Free and Open Source Software (FOSS) solutions, provided online by EIFL. Selected as one of the EIFL-FOSS pilot projects, the focus at UZ was on tools that would provide students with visual disabilities enhanced access to the wealth of e-resources available through the library and online (Payne and Singh, 2010).

The two tools that the UZ librarians focused on implementing were the Virtual Magnifying Glass (VMG, http://magnifier.sourceforge.net/) which is a screen magnification tool that allows users to simply place a virtual magnifier over any item on the screen to enlarge it. Using the mouse or the keyboard, the user can determine the

shape and size of the magnified area and the strength of the magnification (Payne and Singh, 2010). This is particularly useful for visually impaired users with low vision, who would otherwise have to rely on hard-to-obtain large print books. The second tool that the UZ library was able to implement through the EIFL-FOSS platform was Balabolka (http://www.opensourcedownload.net/windows/audio-multimedia/speech/balabolka/) which is a text-to-speech tool that reads text aloud from the screen to aid people who have reading difficulties, whether due to vision impairments or other reading difficulties (e.g., dyslexia) (Payne and Singh, 2010).

2.2.2 Extent of Access and Use of Information by Visually Impaired Students

The access of information by the visually-impaired is at an extremely low level. According to the World Health Organization (WHO) "285 million people are visually impaired worldwide: 39 million are blind and 246 have low vision. About 90% of the world's visually impaired live in developing countries" (WHO, 2012). However, despite the foregoing figures, the World Blind Union estimates that of the million or so books published worldwide every year, less than five per cent are made available in formats accessible to visually impaired persons, and less than one percent in the developing world. As a result, millions of people have been deprived of access to global knowledge. As marginalized communities, they have been excluded from mainstream community life, resulting in poverty, lack of education, unemployment and dependence on others. This lack of access to information by visually-impaired people in the developing world is also partly responsible for the persistence of negative stereotypes and prejudice against

visually-impaired people, particularly in terms of their intellectual capabilities. These issues are addressed at length in a subsequent section.

It is unfortunate that currently, the law, particularly in sub-Saharan Africa, does little to resolve the problems that visually-impaired people face in accessing information. This is revealed in the study by Nicholson (2012), which demonstrated that only four African countries had enacted legal provisions for persons with sensory disabilities into their national copyright law. According to the author, Cameroon, Nigeria and Rwanda have provisions for blind persons only, while Malawi's proposed Copyright Amendment Bill (2010) provides for blind persons but had not been passed (at the time of publication). On a more positive note, Uganda has legal provisions for both groups, i.e. transcription of Braille for blind persons and sign language for Deaf persons in its copyright legislation (Nicholson, 2012). Of the remaining African countries, none of them had any specific limitations and exceptions for persons with sensory disabilities. This indicates that in the majority of these countries, it is difficult, if not almost impossible for visually-impaired persons to access information in a format that they can use. This is exacerbated by the link between disability and poverty that is found in many developing countries, which means that many visually-impaired persons may not even have the capacity (such as Braille reading skills) to use information resources, even if they were available.

Nevertheless, it is possible under international copyright law to allow for exceptions to copyright rules within domestic law, especially for the benefit of groups such as the visually-impaired. Thus it is possible for developing countries to enforce limitations on copyright law relating to 'fair use' or 'fair dealing', or exceptions relating to certain

permitted acts, such as private reproduction, translation (mainly through licensing options), adaptation, arrangement and/or other transformation of a work, or parallel importation, which could possibly be applied to persons with sensory disabilities too. They may also have other laws or regulations that influence or impact upon their copyright legislation. Such exceptions would allow for the transfer of information in printed form to formats accessible to the visually-impaired, such as Braille or audio books, without infringing copyright law.

It is also noteworthy that there are no standard copyright limitations and exceptions addressing persons with sensory disabilities. For blind persons, even 'fair use' or 'fair dealing' provisions cannot be exercised, because of other restrictions that create access barriers, such as the making of adaptations, format-shifting, technological protection measures and licensing. Consequently, it was necessary for an international framework to be set up to allow for greater access to information by the visually-impaired, without getting into the tangle of different provisions of international and domestic copyright law. This framework has been established under the Marrakesh Treaty.

The significant aspects of the Marrakesh Treaty are that it specifically calls on Member States to establish exceptions and limitations to copyright holders' exclusive rights in their national copyright laws to allow for the unauthorized creation of formats that are accessible to the visually-impaired (such as Braille, audio and large print). It does not, however, prevent the possibility of individual States requiring the payment of reasonable royalties to copyright holders for conversion of their works to accessible formats. The treaty provides for the free flow of accessible copies for use by persons with visual

disabilities domestically, regionally and/or internationally, i.e. countries are obliged to allow the cross-border export of works to persons with visual disabilities in accessible formats. There is a provision, though, that export of accessible format copies or re-exports of such copies received from abroad is only permissible under exceptions from exclusive rights recognized under the WIPO Copyright Treaty or meeting an equivalent standard under the new Marrakesh treaty (SAMRO, 2013). The disadvantage of the approach adopted under the treaty is that copyright holder's rights are given more weight than the rights of visually impaired persons to access information. This means that the only way the visually-impaired in developing countries can access information in accessible formats is to purchase them from the copyright holders at high cost, or to use information that is in the public domain, which is no longer protected by copyright, and which may be outdated.

A further provision is that any cross-border exchange or domestic use must take place through authorized entities which will have to meet certain accountability and transparency requirements. The work may also not be altered or used outside of the envisaged scope, aimed at protecting the integrity of the copyright-protected work (SAMRO, 2013). However, it is unclear how these authorized entities will be established or identified, and how their activities will be monitored to ensure that they do not breach the terms of the exceptions laid out in the treaty. Furthermore, it is not apparent as to whether it is the responsibility of the state or of the copyright holder to supervise the authorized entities. If the state has sole control, it may flaunt the scope of the limitation

under the treaty, and if the copyright holder has control, then it may limit the full enjoyment of the rights of visually-impaired persons to access the information.

Although one of the outstanding aspects of the treaty and implication for access to knowledge is that it calls on States' parties to undertake efforts to ensure that technological protection measures (TPMs) do not block or hinder the flexibilities granted to the treaty's beneficiaries (Benedict, 2013) the alternative scenario is that states do not have equal bargaining power in the international arena. This is especially true in the area of intellectual property, where the developed world produces the bulk of copyrighted material which developing countries are seeking to copy and convert to accessible formats. Due to economic and political reasons, the state of the copyright holder may be unwilling or unable to grant developing states the freedom to use the copyrighted work to benefit the visually-impaired. Thus, unless there are further provisions and negotiations, measures to ease TPMs may exist on paper only World Intellectual Property Organization (2015).

The most admirable implication of this treaty for the developing world is that it will restore dignity, self-esteem and independence to millions of blind and visually-impaired persons, who have been the victims of discriminatory copyright laws and practices that have created barriers to accessing knowledge. However, this will require the cooperation of organizations for the visually-impaired in the developed world. Discriminatory copyright laws are enforced against sighted persons in the third world too, thus these organizations will have to re-frame copyright issues and target them specifically to the right of access for the visually-impaired. This is because lobbying for the same right of

access to information for sighted people in the developing world has so far been unsuccessful.

This treaty is expected to raise the status of the visually-impaired from ‘charity cases’ or marginalized and generally unemployed communities to equal citizens with equal rights. It will provide better opportunities to access information to enable them to exercise other human rights which have to date been prejudiced or violated, because of their lack of access to information and knowledge. Despite the foregoing, there is still need for governments in developing nations to support their visually-impaired populations; otherwise their efforts to exercise their rights will be superseded by the commercial interests of copyright holders World Intellectual Property Organization (2015).

The access and use of information is taken seriously in Norwegian Libraries where the full time position of information officer has been established to assist and guide the users of the public libraries, also those who have visual impairments. Their role is also to market the new services to the local community and to see to what the equipment is functioning satisfactorily. They also keep a log of feedback and experiences with the services. This role is considered a very important measure to increase the accessibility to the services for all kind of users also in Sweden and France (Eymard, 2002). Although this is a commendable move, it is unlikely to be replicated in the developing world, in which overall literacy rates are low, even more so among the visually-impaired. There are also resource constraints which mean that employing information officers in public libraries for the visually impaired may be impractical, although it is a good idea for university libraries to adopt.

One way around the copyright debate is to encourage the use of free and open source software (FOSS). This provides up-to-date, adaptable solutions that help libraries meet today's challenges and stay on budget by investing in staff skills rather than in commercial products. FOSS is software released under licenses that ensure users always have (1) the freedom to run the program for any purpose; (2) the freedom to study how the program works and adapt it to their needs; (3) the freedom to redistribute copies of the program to others; and (4) the freedom to improve the program and release those improvements to the wider community. "Free" here refers to the freedom of how the software is used and not necessarily to the price of the software, although FOSS is usually available for download at no cost. Because FOSS is generally available at no cost, it means that with some technical knowledge, a library can implement software that would otherwise cost money. Well-known examples include the Apache Web server, on which the vast majority of websites in the world reside, the Firefox Web browser, the Open Office suite, and the Linux Operating System (Payne and Singh, 2010). FOSS also includes the EIFL-FOSS (Electronic Information for Libraries-Free and Open Source Software) platform, which through the use of freely available software, allows the VIS to access the vast amounts of information that can be freely found online.

2.2.3 Facilities Provided to Assist Visually Impaired Students

According to Nicholson (2006), the provisions of the Marracesh Treaty mean that visually-impaired students will have greater access to textbooks and study material as these will be converted into Braille and other accessible formats. The conversion will be done for both copyright-protected material and orphan works, which are those whose

rights-holders are unknown. Thus, under the treaty, students will avoid the payment of copyright fees, as well as the long process of copyright clearances, which will boost their prospects of academic success.

The author also notes that audio books are more available than ever before, but they still cannot compete with print publications in terms of availability (Nicholson, 2006). Therefore, the visually-impaired have to wait longer than sighted persons before they can access newly published material. Fortunately, the Marrakesh Treaty allows for conversion of new titles to accessible formats by authorized entities as soon as possible after they have been published in print.

It is also expected that speakers of the same language will be the first to benefit from the provisions of the Marrakesh Treaty. This is because the publishing industries in various languages use distribution networks that are closely connected to the colonial history of modern states. Thus the authorized entities in the developed world, such as the UK, France, Spain, Portugal, and the Arab countries will distribute accessible format books to the visually-impaired readership in developing countries in which these languages are also spoken, due to the colonial legacy. A similar phenomenon is expected to occur in the countries of the former Soviet Union, where Russian is the common language, although EIFL (2013) reports that visually-impaired readers in these states still rely on outdated textbooks from the Soviet era.

The significance of the Marrakesh Treaty can better be understood in relation to the situation that existed prior to the treaty, as explained by Natsis (2013). Previously, states

could not share accessible format works across borders. This meant that visually-impaired persons in developing countries could not read works created in other countries, and that works had to be converted into accessible formats separately in each country where they were required, leading to a lot of duplication of effort and resources. As a result, visually-impaired persons were denied timely access to knowledge and they had to rely on outdated material. With the Treaty, however, cross-border distribution of accessible formats will be legalized, and so it can be done at considerably less cost and effort than the previous system.

With the development of technology, publishing is increasingly moving online, through e-books. However, e-books pose some of the same problems for the visually-impaired that conventional books posed before. This is because there are technological protection measures (TPMs) that restrict access to information on e-books by blocking software that converts text to speech. Under the Marrakesh Treaty, however, these restrictions can be removed without seeking permission from copyright holders, and also allows e-books to be printed in Braille, similarly without seeking permission. This resolves the ironic situation in which a visually-impaired person could not access a legally purchased e-book without copyright clearance (Natsis 2013).

Institutions of higher education have been instrumental in improving access for the visually-impaired (Lancaster et al, 2001). They have done this mainly through the use of technology, such as spell-checkers, voice-input software, electronic reading machines, talking calculators, computer-screen readers, specialized keyboards, and tape recorders;

to the extent that Wall and Sarver (2003) have remarked that there is an increasing level of integration between disability and technology.

To a large extent the facilities that are provided to assist the visually-impaired in any context depend on the social system within which the visually-impaired live. This is explained by the social model of disability developed by Oliver (1990) and confirmed by the findings of Robertson (2012). the social model of disability is based on the premise that disability is defined by social barriers, and that if these social barriers are removed, then persons with disabilities will be able to use the same services as non-disabled people (Robertson 2012). The author proceeds to explain that the social barriers that define disability may be physical, or attitudinal, or behavioural. Thus universal library access is called for through building ramps next to stairs, installing automatic doors to help wheelchair users, access to information in formats like Braille and large print for the visually-impaired, use of Closed Circuit Television (CCTV) for the deaf, and the provision of other technologies such as Braille embossers for the conversion of print materials, and screen magnification for those with low vision (Shava 2008). In addition, some of the architectural barriers that affect wheelchair users are also daunting to visually-impaired persons, such as steps (especially those at the entrance to a building), narrow stairways and lack of ramps (Todaro 2005).

2.2.4 Information Need for Visually Impaired Students

The importance of information in human life cannot be overstated. All people need information, regardless of whether they are disabled or not, and the role of a library should be to provide accurate information in a timely manner and in a diversity of

formats to its users, without consideration as to race, ethnicity, religion, age, nationality, language and disability status. Discussing the situation in Tanzania, according to Bagandanshwa (2006), all persons have a right to information, regardless of disability, and that information is power because it is the source of knowledge, and knowledge empowers its possessor to influence the surrounding environment. This is confirmed by UNESCO (1997) who states that the needs of each person are equally important and that these needs must form the foundation of all planning for information provision. It is through such a method that equal rights to information will be accessed.

From Iran, Kharamin and Siamian (2011) state that libraries are at the forefront of developing an inclusive society, as they provide equal service to all, including the visually-impaired. The authors also state that an ideal library service should provide access to information resources as soon as they are required, in the necessary format, in the required quantity, and that this should be done regardless of the disability of the user, and that staff should understand and accommodate all these user needs.

This is supported by Fullmer and Majumder (1991), who argue that because knowledge is power, access to information (which is the foundation of knowledge) and the ability to use it gives a person the chance to choose from many alternatives, rather than being limited to a few undesirable and limited choices. Therefore, people with visual disabilities require access to information in accessible formats, such as Braille and large print, among others. Therefore, Gunde (1991) states that libraries can meet the information needs of the visually-impaired by providing a diverse range of books in accessible formats including large print, audiobooks, and Braille. This is supported by

Adetoro (2011) and the American Foundation for the Blind (2013) who assert that transcribing information into accessible formats is the only way to make information useful to the visually-impaired.

Atkinson and Dhiensa (2007) highlight the importance of Braille to the visually-impaired, as it is the main format available to them. Furthermore, after the process of conversion/transcription/embossing has been completed, the visually-impaired user does not require any further technology to access it, but only the skill of reading Braille. Thus, because it is relatively "low technology", Braille still has a significant part to play in access to information by visually-impaired persons in the developing world, and it will serve as the mainstay of access, at least until electronic formats become better established.

2.2.5 Extent to Which Needs of Visually Impaired Students are Met

Although most authorities and practitioners are aware of the information needs of the visually-impaired, there is a disparity between this awareness and the actual meeting of these needs. This is due to various factors that have already been discussed, such as copyright restrictions, discrimination, resource constraints and so on. One way in which the information needs gap can be bridged is through the use of information technology.

Indeed, information and communication technology (ICT) can be used to assist people who cannot use traditional print, or even those who cannot use Braille (Atkinson and Dhiensa, 2007). According to Tilley, Bruce and Hallam (2007), the use of appropriate ICT can help libraries to maintain, improve or increase the access of persons with

disabilities, including the visually-impaired. This point of view is also supported by Babalola and Haliso (2011) who state that libraries should adopt new ICT to enhance the experience of the visually-impaired users.

However, the implementation of ICT in libraries to assist the visually-impaired varies from country to country. Sub-Saharan Africa is lagging in this respect and the case of Tanzania is instructive. According to Tungaraza (2010), university libraries in Tanzania, including the oldest and most prestigious university in the country, the University of Dar es Salaam, do not have alternative information resources for people with visual impairments (they do not even have information in Braille). Thus libraries get around this problem by employing sighted readers to read print books to them. However, the number of readers is inadequate, so some students have to rely on friends to read for them.

These findings have been replicated by diverse authors in different countries in Sub-Saharan Africa, including Tanzania (Kaijage1991; Ndumbaro 2009; Bagandanshwa 1998), Kenya (Ochoggia 2003) and South Africa (Shunmugam 2002). All of the aforementioned authors cite resource and capacity constraints as the reason for lack of accessible formats of information for the visually-impaired in their respective countries.

The current state of affairs as stated above is unsustainable, as Dragoicea et al., (2009) insist that assistive technologies are prerequisites for people with visual impairments to access information resources housed in academic libraries. This means that academic libraries in Sub-Saharan Africa have no choice but to adopt accessible formats. Although initially costly, ICT can bridge the information gap for the visually impaired more rapidly

for the visually-impaired because it is accessible to all, including those who cannot read Braille. Furthermore, through ICT, users have access to vast numbers of free online resources, which they would not have access to using Braille (Bagandanshwa, 2006).

Apart from the cost of computers and adaptive technology, there are a number of barriers to full accessibility for the visually-impaired. These include technological challenges, lack of skills at using a computer without vision, personal factors and poor web design. Web design is a particularly crucial obstacle in accessing library's online resources (Brophy and Craven, 1999) as poor design may make it virtually impossible for a visually-impaired person to access the information needed. Unfortunately, due to these factors, libraries are not regarded with much enthusiasm among the visually-impaired. In addition, in the past libraries did not serve blind patrons very well regarding large print and talking books especially for those who can't read Braille. Similar dissatisfaction was revealed by a study of library user's satisfaction in the UK (Creaser *et al*, 2003).

2.2.6 Challenges Experienced by Visually Impaired Students

The challenges facing visually-impaired students are numerous and well documented. Indeed, the great challenge they face in using libraries is that the majority of libraries and archives are overwhelmingly concentrated on providing information in the form of print, and that they are slow in the adoption of alternative formats, particularly ICT. Legal provisions on copyright established in the print era increasingly fail to address the legal and policy challenges of the global digital environment (IFLA, 2013).

This has been confirmed by a wide number of studies, which have developed into an overarching theme in the international literature on how disabled students face both physical and attitudinal barriers within the university environment (Paul, 2000). Although there is a considerable volume of scholarly literature on the sociology of disability in higher education from high-income countries in the Global North, this is not matched by a similar body of literature on the same issue in the developing world. Consequently, Meekosha (2008) argues that there is a need to develop third world perspectives on disability and access to information. Unfortunately, there is still very limited knowledge about the experiences and participation rates of disabled students in higher education and system-wide inclusive education in low-income countries (Croft, 2010).

This is in sharp contrast with the research carried out by West *et al* (1993) who surveyed 40 US College and university disabled students to determine their levels of satisfaction with accessibility, special services, and accommodations at their institutions of higher learning. The majority of the students revealed that they had encountered obstacles to their education, including a lack of empathy and assistance from administrators, faculty, staff, and other students; lack of adaptive aids and other accommodations; and inaccessibility of buildings and grounds.

One of the few studies carried out on inclusive higher education in Rwanda was done by Karangwa (2008), who demonstrates that the state in Rwanda intervened in order to improve the level of inclusive education. This was done when a team in the Kigali Institute of Education reviewed application and selection criteria and advised the Ministry of Education about adjustments and equipment needed to assist disabled

students. The Ministry assisted by the National Examination Council and the National Federation of the Disabled, supplied the Institute with a list of more than 250 applicants with various disabilities who had qualified but could not get into university. As a result, for the first time institutions of higher education in Rwanda became aware of the needs of disabled students, including the visually-impaired, and began to take measures to improve accessibility. Nevertheless, there were still some teething problems, as explained by Karangwa (2008): "The first few days in the university were shocking for the disabled students, and their non-disabled peers. Everyone knew from the media that these students would be enrolling. But sighted students were still surprised to see blind students on campus asking to share their notes, though many were eager to help."

2.3 Solutions to Improve Access and Use of Information for VIS

The Marrakesh Treaty (2013) is expected to revolutionize the way in which visually impaired persons access information in both academic and non-academic settings. However, the treaty is still in its infancy, so it may take some time before its provisions are realized. Nevertheless, it proposes the highest level of access for library and archive users within the framework of international copyright treaties and conventions. It is expected to have positive implications for library users around the world, and particularly in the developing world, where the cost of books, journals and other reading material is prohibitively expensive. This ought to be even more beneficial to the visually-impaired, as the exceptions under the treaty allow for copyright restrictions to be waived on their behalf.

It is noteworthy that libraries are often the only source of information for many people in developing countries. For the visually-impaired populations of these countries, even public libraries may be inadequate for the task. Thus academic libraries should take the first step, by promoting inclusive access. The provisions of the Marrakesh Treaty will enable them to provide lending and document delivery services, preserve cultural heritage and library collections for perpetuity. Resource constraints are the major reasons why many libraries in developing countries are unable to convert their collections to accessible formats, which mean that much of their accessible content is either obsolete or inaccessible. The Marrakesh Treaty will empower libraries to convert print material to electronic formats for access and preservation purposes.

Fortunately, in many countries, disability in higher education, has received priority policy attention through national initiatives to improve inclusive participation. For example, in the UK, the Dearing Report (1997) underscored the importance of widening participation for disabled students as well as those who experience social disadvantage (Tinklin *et al*. 2004). Furthermore, inclusive education is enshrined in Article 24 of the United Nations Convention on the Rights of Persons with Disabilities (2006) in which ratifying states are required to ensure an inclusive education system at all levels, partly by providing appropriate staff development.

Lee (2007) concurs with the foregoing, and insists that libraries are an important part of society that reflect and sometimes lead social trends. The enactment of anti-discrimination acts in many countries is necessary to make mainstream library services accessible to people with disabilities. Academic libraries can be at the forefront of

inclusive change, by being designed to be universally accessible, in such a manner that access for people with disabilities should not be an add-on to existing services. Therefore, libraries should have equipment in place that facilitates both easy mobility and easier intellectual access for those who are challenged by visual impairments and rely on wheelchairs (Deines-Jones 2007).

The Netherlands has taken steps in this direction, by establishing a working group with representatives from the libraries for the blind and the Dutch Centre for Libraries and Reading for closer cooperation (Veer, 1996). This intervention aims at improving the quality of services in both public libraries and libraries for the blind. Libraries have already implemented a number of initiatives, including regional information centres, talking book services and online catalogues for the blind. Although this intervention is aimed at public libraries, it contains salient points which can be adopted by academic libraries in the developing world, and implemented as best practice.

2.4 Chapter Summary

The literature review has examined the literature on access and use of information for visually-impaired students, under different headings including establishing information sources available for visually impaired students, determining the extent to which visually impaired students access and use information materials at university libraries, examining the facilities provided to assist visually impaired students at university libraries, establishing the information need for visually impaired students at university libraries, analyzing whether the extent to which the needs of visually impaired students at university libraries are met, identifying challenges experienced by visually impaired

students in accessing and using information at university libraries, and proposing solutions to improve access and use of visually impaired students at university libraries.

It is evident from the foregoing literature review that access and use of information for the visually impaired has been studied extensively in many different contexts around the world. As a result of this extensive research, many useful findings and conclusions have been arrived at. However, the overwhelming majority of studies have focused on the developed world, and thus they do no take into account the different circumstances that academic libraries face in developing countries. Thus there is a gap in the literature on how academic libraries in developing countries solve challenges of access and use of information for visually impaired users. Therefore, this study would provide the information that can bridge that gap in knowledge about the access and use of information for visually-impaired students in the three campuses of UR.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The chapter delineates the methodology, procedures and modalities in data collection. It also covers research design and target population, sampling procedure, sample size, instruments of data collection, validity and reliability of data, sources of data, data collection procedure, methods of analyzing the data and ethical consideration.

3.1 Research Design

Descriptive research design was adopted in the present study. Descriptive research studies are those studies, which are concerned with describing the characteristics of a particular individual, or of a group (Kothari, 2009). These are studies, which are concerned with specific predictions, with narration of facts and characteristics concerning individual, group or situation. Descriptive design therefore is concerned with making accurate assessment of the incidence, distribution and relationships of phenomena.

According to Kothari, (2009), a descriptive study presents what is and interprets the nature of an ongoing event. It is concerned with conditions or relationship that exists, opinions that are held processes that are ongoing, effects that are evident, or trends that are developing. It is primarily concerned with the present, although it often considers past events and influences as they relate to current conditions. It aims at getting a true picture of a situation, behavior or attitude of individuals and community at large. This is preferred because it is efficient in collecting large amounts of information within a short

time. It is the most appropriate design where self-reported beliefs and opinions of participants are sought (Neuman, 2000). The descriptive survey research design was suitable for this study because the descriptive study determines and reports the way things are (Gall, 2007). The researcher adopted this descriptive research design to be able to describe the phenomenon as it is on the ground.

3.2 Area of Study

The study was carried out at University of Rwanda. University of Rwanda is the public University established by the Government of Rwanda through the law no 71/2013 of 10/09/2013. It resulted from the merge of the nation's seven public Higher Learning Institutions into a consolidated entity governed by the Board of Governors and an Academic Senate with strong staff and student representation, along with the Vice Chancellor who is the University's chief executive officer. UR's Titular Head is the Chancellor, and it consists of the following academic entities. University of Rwanda, covering College of Arts and Social Sciences (CASS), College of Education (CE), College of Business and Economics (CBE), College of Agriculture, Animal Sciences and Veterinary Medicine (CAVM),College of Medicine and Health Sciences (CMHS) and the College of Science and Technology (CST).

The Huye Campus is one of the University of Rwanda (UR) campuses created in 2013 by the law number 38 of 23/09/2013. The Huye Campus Library has a collection of 150 000 books and subscribes to 28 titles of printed journals. The Library subscribes to 33 000 e-journals and free access to open e-resources. The Huye Campus Library has 16 library staff.

College of Business and Economics was officially enacted as part of University of Rwanda on Law 38 of 23/09/2013. Currently, CBE Library provides access to over 17,000 volumes of print resources and more than 60 databases and e-books. Services available at CBE Library includes: Technical Processing of Information Resources, library and reference Service, acquisition of theses, document delivery and reprographic services, online search service and 8 Library staff.

College of education (CE) the former Kigali Institute of Education (KIE) has a library collection consists of both print and electronic resources and currently has a total book volume of 74,159 books; standing at 18,054 titles and access to more than 50 databases and about 100 e-books. Both print and electronic resources have been selected with care, and are constantly updated, to support the needs of students and faculties in academic and scholarly. Services available at CE Library: technical processing of information resources, library and reference service, current awareness service (CAS), selective dissemination of information (SDI), bibliography on demand/literature search service, acquisition of theses, document delivery/inter-library loan/reprographic services and online search services and 7 library staff.

The University was selected as research area because the University was the only University with visually impaired students. The University of Rwanda is the only public University in Rwanda and as such it is a multi-campus, multi-disciplinary university designed to meet the economic, social and cultural needs of the country and its people. The University of Rwanda is the only university where there are enough access to

modern facilities and teaching by our internationally qualified staff. Therefore, the study sought to investigate access and use of information for visually impaired students at the University of Rwanda libraries.

3.3 Target Population

According to Neuman (2000) the term "population" refers to the totality of all objects, subject or members that conform to a set of stipulations. For the purpose of this research, the population of study comprised the library staff, lecturers of University of Rwanda, deans of students and visually impaired Students with a total population of 582. This comprised of a population of 31 library staff, 520 lecturers, 3 deans of students and 28 visually impaired Students that cut across Huye Campus, College of Education (CE) Remera Campus and College of Business and Economics (CBE) Gikondo Campus. Therefore, it was anticipated that these target population would provide the required sample size for the study as shown in the table 3.1

Table 3.1: Target Population

Strata	Huye Campus	College of Business and Economics Gikondo Campus	College of Education Remera Campus	Total
Library staff	16	8	7	31
Visually impaired Students	9	6	13	28
Campus dean of students	1	1	1	3
Lecturers	384	50	86	520
TOTAL	**410**	**65**	**107**	**582**

Source: Survey Data, 2014

3.4 Sample Technique and Sample Size

This is a definite method for obtaining a sample from the sampling frame. It refers to the technique or procedure the researcher uses in selecting the sample from the population. The major criterion to use when deciding on the sample size is the extent to which the sample's size is representative of the population (Leedy, 2003). In seeking information towards the context of this study, the researcher used a complete census technique of the 28 visually impaired Students and 3 campus deans of students. This is preferred because the target population was not large. Also, purposive sampling was used to sample 8 library staff who deal with these students and 26 lecturers who had more than two hour contact with visually impaired students per week.

Non-probability sampling is also known by different names such as deliberate sampling, purposive sampling and judgment sampling. In this type of sampling, items for the sample are selected deliberately by the researcher; her choice concerning the items remains supreme. In other words, under non-probability sampling the organizers of the inquiry purposively choose the particular units of the universe for constituting a sample on the basis that the small mass that they so select out of a huge one will be typical or representative of the whole (Kothari, 2004). This is shown in the table 3.2

Table 3.2: Sample Size

Strata	Huye Campus	College of Business and Economics Gikondo Campus	College of Education Remera	Total	Sample
Library staff	16	8	7	31	8
Visually impaired Students	9	6	13	28	28
Campus dean of students	1	1	1	3	3
Lecturers	384	50	86	520	26
TOTAL	**410**	**65**	**107**	**582**	**65**

Source: Survey Data, 2014

3.5 Data Collection Method and Instruments

A mixed method of data collection using questionnaires and interview was deployed. Interview schedule were used for collecting data from visually impaired students, campus deans of students and lecturers whereas questionnaire was used for collecting data from Library staff. These are briefly discussed below.

3.5.1 Questionnaires

Data was collected using structured questionnaires to be administered to the library staff. A structured questionnaire was preferred for collecting data because in such a questionnaire, the questions, their wordings and sequence are fixed and identical to all respondents. This has the advantage of obtaining standard responses to items in the questionnaire, making it possible to compare between sets of data.

The Questionnaire on access and use of information for library staff at the University of Rwanda libraries was intended to capture the their perceptions on the extent at which visually impaired student's access and use of information at the University of Rwanda libraries. It consists of two parts: Part A was based on demographic information; Part B was based on specific research questions. The respondents answered the questionnaires by expressing their opinions where the responses were designed on a five-point Likert scale ranging from strongly disagree to strongly disagree. The data for this study was collected through actual visits to the University of Rwanda libraries. The researcher personally administered the questionnaires to the library staff. A sample of the questionnaire is provided as an appendices B.

3.5.2 Interviews

Berg (2001) points out that in qualitative research, using in-depth interviews is like steering a conversation toward the right direction while allowing participants to structure their own responses. The method of conducting interviews allowed participants to remain in their natural setting, which is important for this study. A semi-structured and open-ended interview was used in gathering data from visually impaired students, Dean of students and lecturers.

Interviewing is an important way to collect rich, detailed information about how participants view their worlds. The goal of interviewing for this particular study is to draw out the perspectives and views of visually impaired students in face to face and phone interviews. Patton (2002) sets forth three basic interview types as informal

conversational, the interview guide approach and the standardized open-ended method. For this study, the interview guide approach was selected as an appropriate technique because it would best elicit the participant's worldview. Using this method, a few broad questions were identified by the researcher to help uncover the perspectives of the interviewee. The interviewer remained flexible and actively listens to the participant's narratives. Since interviewing is seen as a "conversation with meaning" between the participant and the researcher, Rossman & Rollis (1998) propose a technique called "dialogic interviewing" as an alternative for qualitative researchers." A dialogic interview can be described as a "true conversation in which researcher and participant together develop a more complex understanding of the topic" (Rossman & Rallis, 1998). The dialogic interview offered a better balance of talking between the researcher and participant. The interview questions for visually impaired students, campus dean of students and lecturers are provided in appendix C, D and E.

3.6 Validity and Reliability of the Instrument

Validity of the Instrument - Validity is concerned with whether the findings are really about what they appear to be about (Saunders *et al.*, 2007). The validity of the instrument was ensured in three ways. First, the researcher discussed the items in the instrument with the supervisors and lecturers from the department. Thereby every item in the questionnaire was crosschecked and measures what is supposed to measure. Secondly, the instrument was piloted where the responses of the subjects was checked against research objectives. Also, the findings of this study were validated in statistical studies.

The researcher make used of key informants to reviewed the report. In order to perform this technique several respondents were asked to comment on some of the conclusions.

Reliability of Research Instruments - Reliability of the instruments was determined in order for the researcher to ensure consistency in the responses given by respondents. The major aim of discovering instruments reliability was to find out the extent to which research tools yielded consistent results (Fraenkel & Wallen 2006).

The research instrument was pre-tested in two private universities in Rwanda, namely, Catholic University of Rwanda and Kigali independent University. The two private universities were chosen because they had students with visual impairment. The environmental setting in these universities was the same as where the study was carried out and the students were subjected to the same curriculum and taught by the lecturers with similar professional qualification. The researcher administered questionnaires to four lecturers, two from each private university. Two visually impairment students and one librarian were picked randomly from each private university. The purpose of piloting was to help identify any ambiguous and unnecessary items in the instruments. It checked suitability and level of language and checked validity and reliability of instrument. The questionnaires were filled, analyzed and the results discussed with the respondents. Any corrections found to be necessary was made before administration of the final questionnaires. The universities used for the piloting were not part of the main study.

3.7 Data Collection Procedures

The researcher proceeded to collect data from the selected respondents after receiving clearance from the University of Rwanda to conduct the research. Permission to conduct research was sought from the University of Rwanda, Research and Postgraduate studies Unit. The permit was used to secure permission from the respondents in Huye Campus, College of Education (CE) Remera Campus and College of Business and Economics (CBE) Gikondo Campus. The researcher administered the instrument in each of the selected College after obtaining their permission to do so from the concerned authorities. In each of the College, questionnaire was administered to respondents. The instructions were read to the respondents as regard the filling of the questionnaire.

3.8 Data Presentation, Analysis and Interpretation

Qualitative data was first thematically analyzed before being quantified for descriptive analysis. The results obtained using questions and interview method was merged to answer the research questions. Descriptive analyses such as frequencies, percentages were then used to analyze data and later present them in the form of tables and frequencies.

3.9 Ethical Consideration

Creswell (2003) recognized ethics as the application of moral principles while interacting with others in order to be respectful and fair and promote healthy relationships. This entail that, it is not enough for the researchers to be aware of fundamental principles

guiding ethical decisions, they should also be concerned about ethics so as to be cautious of hurting people who have something to do with the research.

Keeping in line with fundamental principles guiding ethical decisions, a letter from Moi University, School of Information Sciences was used to seek for authority to collect data from the Ministry of Education, Government of Rwanda. The nature and the purpose of the research were explained to the respondents by the researcher before undertaking the research. The participants were assured of anonymity of their identity and responses confidentiality and voluntary participation. No names or person identification numbers were reflect on the questionnaires except the numbers for questionnaires, which was done for purposes of identification during data capturing and questionnaire processing.

3.10 Chapter Summary

Chapter three presented the methodology used in investigating the access and use of information by visually impaired students at the University of Rwanda Libraries. The chapter covered the research design, population and sampling techniques, research instruments, validity and reliability of instruments, data collection procedure, data analysis and interpretation and ethical issues considered in this study were discussed in this chapter.

CHAPTER FOUR
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

The aim of this chapter is to analyze the empirical data which was collected as per the objectives and the research questions in order to provide a real picture about access and use of information by visually impaired students at the University of Rwanda Libraries. This chapter includes six main sections. The section 4.1 presents test of response rate Section 4.2 presents information sources available at the university libraries for the visually impaired students while section 4.3 presents findings on the extent of use and access of information by the visually impaired students. Section 4.4 provides information concerning the facilities and support system in place for visually impaired students at the University of Rwanda, which is preceded by section 4.5 that highlight how the needs of the visually impaired students is met at the university library in Rwanda. The final section 4.6 presents data on the challenges experienced by the visually impaired students in accessing and using information at the university of Rwanda libraries. Tables and figures have been used to summarize and illustrate the findings of the study.

4.2 Response Rate and Characteristics of Respondents

4.2.1 Response Rate

The study targeted a total of 65 respondents comprises of 8 library staff administered with questionnaires while 28 visually impaired Students, 3 campus deans of students, and 26 lecturers totaled 57 were interviewed as indicated in Table 4.1.

Table 4.1: Response Rate

Strata	Sample size	Response Rate	Percent
Library Staff	8	7	98.4%
Visually Impaired Students	28	28	100%
Campus dean of students	3	3	100%
Lecturers	26	26	100%
Total	65	64	98.4%

Table 4.1 shows that the overall response rate was 98.4% (64 respondents: 7 questionnaires and 57 interview responses). One questionnaire was returned and eliminated as the data were being coded because it was only partially completed. After eliminating the unusable responses, 7 questionnaires and 57 interview responses (98.4%) were coded and used for data analysis.

4.2.2 Background Information

In order to understand respondents, some background information was established.

4.2.2.1 Descriptive Analysis of the Sample Statistics

This section provides demographic characteristics of the respondents in the study. It was used as a basic for further analysis of the specific research objectives and their findings using descriptive statistics, frequency tables and percentages. Demographic analysis was performed, since demographic phenomena affect respondents' social and economic behaviour. This information was paramount because it shed light on the nature and calibre of respondents and their grasp on access and use of information for visually

impaired students at the University of Rwanda Libraries. An examination of the questionnaire and interview responses for each of the respondents pertaining to library staff experience in the University of Rwanda, services available for visual impairments students, availability of trained and experienced staff and layout and structures of the library buildings revealed the data in table 4.2 – 4.10.

4.2.2.2 Distribution of Students with Visual Impairments and Library Staff by Schools

The study sought to establish the distribution of students with visual impairments and library staff by schools who were surveyed at the three campus of University of Rwanda. Students with visual impairments and library staff was categorically operationalized using three brackets. The frequency and percentage was calculated. Table 4.2 and 4.3 below present the populations of library staff and students with visual impairments who were surveyed at the three campuses.

Table 4.2: Library Staff by Campuses

SN	**Campuses**	**Frequency** (N=8)	**Percentages**
1	Huye Campus	4	50
2	CE – Remera Campus	2	25
3	CBE – Gikondo Campus	2	25
	Total	8	100

It is evident from the table that a majority of the respondent's library staff and visually impaired students was found to be from Huye with 4(50%) followed by Huye College of Education Remera Campus with 2 (25%) and College of Business and Economics Gikondo Campus with 2 (25%) respectively. Furthermore, the study sought to establish the distribution of students by campuses. The respective frequency and percentage was calculated as shown in Table 4.3 below.

Table 4.3: Students With Visual Impairments by Campuses

CN	**Campuses**	**Frequency** (N=28)	**Percentages**
1	Huye Campus	9	32.1
2	CE – Remera Campus	13	46.4
3	CBE – Gikondo Campus	6	21.4
	Total	28	100

It was observed from the table 4.3 that majority of the students with visual impairments were found from College of Education 13 (46.4%) followed by Huye Campus 13(32.1%) and College of Business and Economics with 6 (21.4%) respectively.

4.2.2.3 Work Experience in the University of Rwanda Campuses

The study sought to establish the distribution of library staff, campus dean of students and lecturers. Analysis of the respondents working experience was necessary since experience is a vital component of the demographic characteristics of the respondents. Experience was considered crucial since certain key decisions made could be as a result

of working experience gained. It was categorically operationalized using four brackets measured in years, by indicating whether less than 2 years, from 2 - less than 5 years, from 5 - less than 10 years and from 10–less than 15 years. The respective frequency and percentage was calculated as shown in Table 4.4.

Table 4.4: Distribution of Respondents by Level of Experience

Years of working experience	**Frequency (N=37)**	**Percent**
Less than 2 years	3	9.3
From 2 - less than 5 years	13	34.0
From 5 - less than 10 years	9	24.7
From 10–less than 15 years	12	32.0
From 15 years above	-	-
Total	**37**	**100.0**

Research findings on work experience showed that library staff, campus dean of students and lecturers respondents had work experience in the range of Less than 2 years to 15 years. According to Table 4.4, 13 (34%) had spent "from 2- less than 5 years" in University of Rwanda; 12 (32%) spent "from 10-less than 15 years"; 9 (24.7%) spent "from 5 - less than 10 years"; and only 3 (9.3%) spent "less than 2 years" working experience. So, about 34 (91%) of respondents have working experience from 2-15 years. These results imply that library staff, campus dean of students and lecturers respondents have the experience that enables them to understand and comprehend the access and use

of information for visually impaired students (VIS) at the University of Rwanda (UR) libraries. This means that the majority of respondents have very good knowledge and working experience, and accordingly, they can give accurate opinions about the research questions.

4.3 Information Sources Available at the UR Libraries and Suitability for the VIS

The first objective of the study was to determine the information sources available at the university libraries for the visually impaired students in University of Rwanda libraries. This was determined by inquiring from the visually impaired students whether the information resources available in their library are suitable for them to access libraries. Responses from the 28 respondents indicated that 25 (90%) responded negatively and 3(10%) who responded positively. Table 4.5 indicates the responses.

Table 4.5: Information Sources Available at the Libraries and Suitability for the VIS

Responses	**Frequency (N= 28)**	**Percent**
Yes	3	10.0
No	25	90.0
Total	**28**	**100.0**

Library staff were also interviewed about whether academic libraries have alternative material for visual impaired students. Despite the few positive responses from visually impaired students, the Library staff responses were negative, indicating that there are no

substitute materials for visual impaired students. In addition, Campus deans of students were also interviewed to establish whether UR libraries have substitute materials for visual impaired students. Again, despite the positive responses above, all respondents (100%) responded negatively.

4.3.1 Availability of Library and Information Services for the VIS in UR

The study sought to determine the availability of Library and Information Services for VIS from the visual impaired students, library staff, and campus dean of students and lecturers of the three campuses of University of Rwanda. The responses were arranged into six items and presents in Table 4.6.

Table 4.6: Level of Availability of Library and Information Services for the VIS (N=64)

Facilities	**N**	Available	**%**	Not available	**%**
Braille printer	64	34	53	30	47
Braille Book	64	36	56	28	44
Talking Books	64	5	7.5	59	92.5
Talking Newspapers	64	-	0.0	64	100.0
Assistive Technologies	64	16	25	48	75
Audio Books	64	35	55	29	45

As indicated in Table 4.6, the findings show that the three campuses of University of Rwanda are deficient in the availability of library and information services for the VIS. Although, the three campuses have Braille printer (53 %) and Braille Book (56 %), audio books (55 %), almost all the three campuses did not have talking newspapers, deficient in the availability of talking books and assistive technologies. This is an indication that library and information services for the VIS are not vigorously provided for the three Campuses of UR. The findings imply that there is an urgent need to improve the existing level of library and information services available to the visually impaired students in the three campuses of University of Rwanda.

4.4 Level of usage Information Materials at the UR Libraries by VIS

The second objective of the study was to determine the level of usage of Information materials by the visually impaired students at the Universities of Rwanda libraries. This was determined by inquiring from the Library Staff and visually impaired students were asked to determine the level of usage of information materials at the UR Library by the VIS. The numbers of respondents responding on the levels scale of high, moderate and low are represented in table 4.7.

Table 4.7: Level of Usage Information Materials at the UR Libraries by VIS

Campuses	High			Moderate			Low		
	VIS	Library staff	%	VIS	Library staff	%	VIS	Library staff	%
Huye Campus (n=13)	1	1	2(15.4%)	2	1	3(23%)	6	2	8 (61.6%)
College of Education (n=15)	3	0	3(20%)	3	0	3(20%)	7	2	9(60%)
College of Business & Economics (n=8)	1	0	1(12.5%)	1	1	2(15.4%)	4	1	5(62.5)

As shown from the table 4.7, in Huye Campus a cumulative total of 8(61%) of Library Staff and visually impaired students attested low levels of access and use of information materials at the University of Rwanda Library for VIS. Also, 2(15.4%) and 3(23%) attested high and moderate respectively. Similarly, in College of Education, a cumulative 9(60%) of Library Staff and visually impaired students attested low levels of access and use of information materials at the University of Rwanda Library for VIS. Also, 3(20%) attested high and moderate respectively. Regarding the extent of use and access of information by the VIS at the libraries in the UR, in College of Business and Economics, a cumulative total of 5(62.5%) of Library Staff and visually impaired students attested low levels of access and use of information materials. Also, 1(12.5%) and 2(15.5%) attested high and moderate levels respectively.

4.4.1 Extend to which VIS Access Information Based on Response of the Dean of Students and Lectures

The researcher also inquired the extent to which visually impaired students access and use information materials at the University of Rwanda libraries. The number of respondents responding and the level scale of agreement are represented in table 4.8.

Table 4.8: Extend to which VIS Access Information (N= 28)

Level of Access to information	N	High	%	Moderate	%	Low	%
Access to information	28	2	9.0	3	10.0	23	81.0
Level of availability of books for VIS.	28	2	6.0	2	9.0	24	85.0
Lack of access to information by VIS	28	1	3.0	1	5.3	26	91.7
Difficult for VIS to access information	28	1	3.3	1	3.0	26	93.7
Ignorance of the VIS to use information resources	28	2	6.2	3	10.4	23	83.4

In Table 4.8, the findings show that most of the respondents believed that access to information at the library was low. Majority of the respondents also attested that books published worldwide are not availed to the visually impaired students. Also, the respondents believed that there was lack of information by the visually impaired students due to negative stereotyping. On the same note, the researcher also established that it is

difficult for the visually impaired students to access library information in a format that they can use. Finally, these findings clearly show that many visually impaired students may not have the capacity to use information resources even if they are available in the library.

Furthermore, the libraries staff, visually impaired students, deans of students and lecturers were asked to establish the level of effectiveness of Library regarding visually impaired students accessing information in the library .The responses were arranged into four scale items of very effective, effective, moderate effective and not effective represented in figure 4.1.

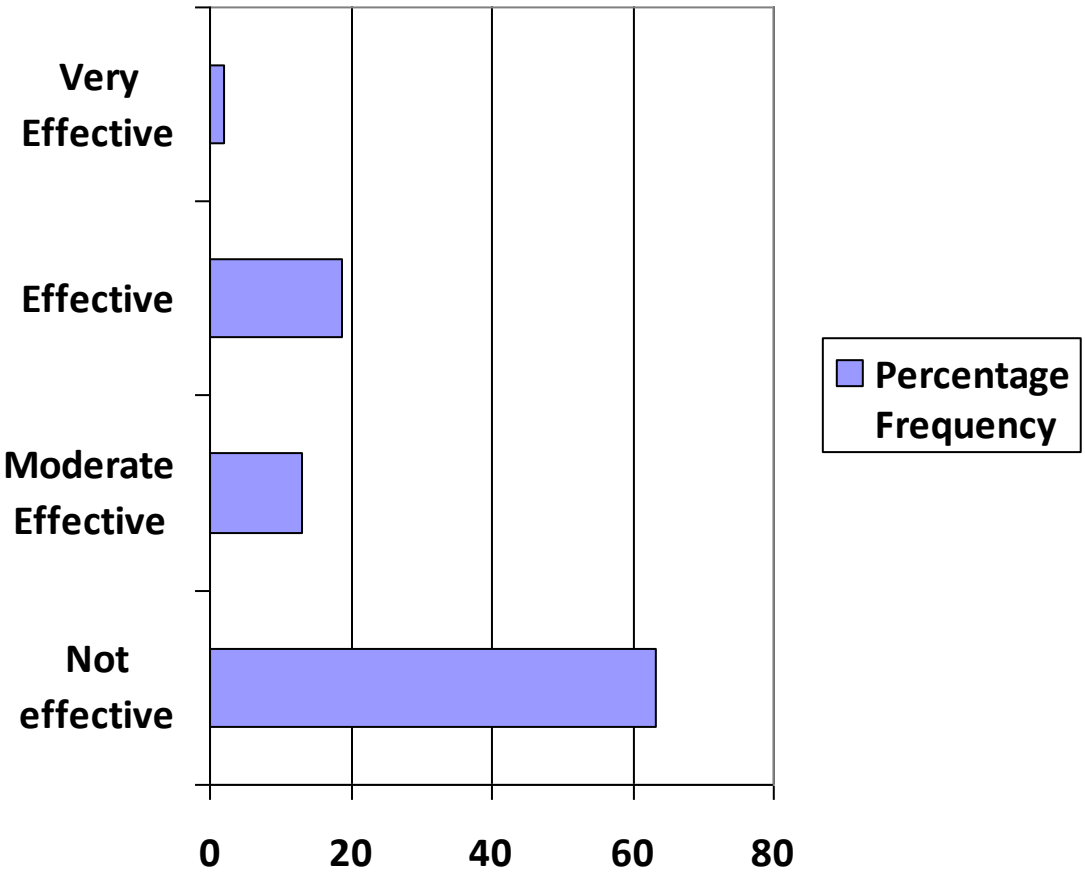

Figure 4.1: Effectiveness of Library Regarding VIS Accessing Information

Based on the figure 4.1, 66.3 % of the respondents believed that it is not effective, 18.6% indicated it is effective, 13.1% believed it is moderate effective while 2.0% indicated that they are very effective.

4.5 Facilities and Support System Provided to Assist Visually Impaired Students

The third objective of the study sought to determine if the University of Rwanda provide facilities and support system that will enhance access to information in the library by the visually impaired students. The respondents responses on the scale of strongly agree, agree undecided, disagree and strongly disagree are represented in Table 4.9.

Table 4.9: Extent which Facilities and Support System for VIS are Available at University of Rwanda Libraries

Level of response	**Frequency** (N=64)	**Percentage**
Strongly Agree (SA)	5	8
Agree (A)	7	11
Undecided (U)	0	0
Disagree (D)	17	26
Strongly Disagree (SD)	35	55
Total	64	100%

Based on responses of libraries staff, visually impaired students, deans of students and lecturers as shown from the table 4.9, a cumulative total of 12 (19%) agreed that to a large extent University of Rwanda provide facilities and support system that will enhance access to information in the library by the visually impaired students. On the contrary, a cumulative total of 52 (81%) disagreed that University of Rwanda libraries provide the needed and sufficient information that will enhance access to information in the library by the visually impaired students. Based on response, majority of the respondents indicated that they strongly disagreed with the notion that the facilities and support system provided by University of Rwanda libraries will enhance access to information in the library among the visually impaired students.

Furthermore, the extent to which facilities and support system for the visually impaired students are available at the university library was also determined as presented in Figure 4.2.

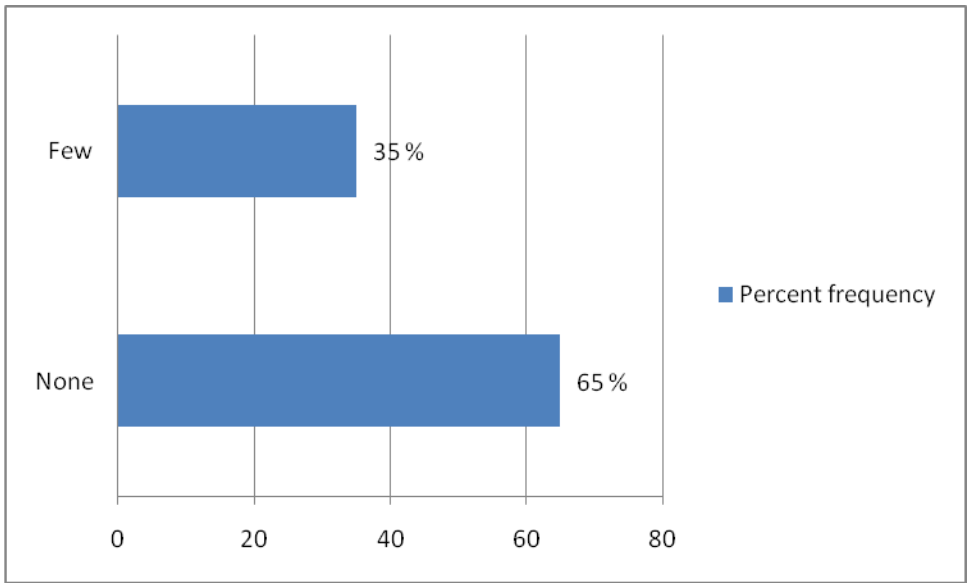

Figure 4.2: The Extent to which Facilities and Support System for the VIS are Available at the UR Libraries

Based on the figure 4.2, 65 % of the respondents believed that the facilities and support system of visually impaired students are not available in the libraries in the three campuses of UR, while 35% of the respondents indicated that they are few.

4.5.1 Library Materials Available for the Visually Impaired Students

The researcher further determined the library materials available for the visually impaired students. The responses were arranged into twelve items and presents in Table 4.10.

Table 4.10: Level of Library materials available for the Visually Impaired Students (N= 64)

Library materials	**N**	Available	**%**	Not available	**%**
JAWS	64	44	68	20	32
Scanners	64	41	64.8	23	35.2
Magnetic glasses	64	39	60.6	25	39.4
Braille equipment	64	28	44.5	36	55.5
Audio books	64	13	20.0	51	80.0
Computer programs	64	4	6.7	60	93.3
Screen magnification Monitors	64	13	20.0	51	80.0
Screen readers	64	4	6.7	60	93.3
Digital audio book	64	4	6.7	60	93.3
Braille software	64	15	23.4	49	76.6
Special rooms	64	13	20.1	51	79.9
Large print	64	5	8.1	59	91.5

As indicated in Table 4.10, the findings show that the three campuses of University of Rwanda are deficient in the availability of library materials for the visually impaired students. Although the three campuses of University of Rwanda have jaws (68%) and scanners (64.8 %) and magnetic glasses (60.6 %), almost all the three campuses did not have enough Braille equipments, audio books computer programs, screen magnification monitors, screen readers, digital audio book, Braille software, large print and special rooms to assist visually impaired students in the usage of library. This is an indication that library materials are not vigorously provided for the three campuses of University of

Rwanda. Unfortunately, in the three campuses of University of Rwanda the provision of library services has been geared more towards the sighted than the visually impaired students. The observation view of available library service provision opportunities for the visually impaired reveals that it is very limited.

4.5.2 Availability Of Trained and Experienced Staff Who Provided For Or Assist Users With Visual Impairments in the Use of Library Services

The study sought to establish Campus dean of students, library staff and lecturers opinion on whether University of Rwanda have staff that were trained and experienced to assist students with visual impairments. This information was essential since trained and experienced library staff were needed to provide for or assist students with visual impairments to access library services and hence are crucial for visual impairments students to access library services effectively. Table 4.11 shows the composition of Campus dean of students, library staff and lecturers responses in this regard.

Table 4.11: Availability of Trained and Experienced Staff to Assist VIS

Responses	**Frequency** (N=36)	**Percent**
Yes	6	16.6
No	30	83.3
Total	**36**	**100.0**

The results show that 30 (83.3%) responded negatively, while 6 (16.6%) responded positively. The respondents' that responses negatively signifying that no specially trained and experienced library staff assist visual impairments students in the use of library services. The findings also showed that staff that provide services to people with visual impairments are not trained to meet special needs of students with visual impairments. Respondents added that the library programmes and curricula of most universities do not include essential module on special needs for students with visual impairments. The respondents that responses positively point out that academic library do have trained and experienced staff that assist students with visual impairments. These results imply that in terms of trained and experienced staff to assist students with visual impairments are concerned; the study established that library staff are often unable to address the needs of students with visual impairments.

4.5.3 Layout and Structures of the Library Buildings

It was necessary to seek information regarding whether the layout and structures of the library buildings allows students with visual impairments to access the information resources domicile in the library. This information was sought from Campus dean of students and students with visual impairments. Responses are shown in table 4.12.

Table 4.12: Access for Students with VIS Facilitated by Layout of Library Buildings

Responses	**Frequency** (N=31)	**Percent**
Yes	6	20.0
No	25	80.0
Total	**31**	**100.0**

As shown in the table 4.12, majority of respondent made of Campus dean of students, and students with visual impairments 6 (20%) concurred positively while 25 (80%) responded negatively. The results indicate that the majority of respondent indicated that access for students with visual impairments did not facilitated by layout of library buildings.

Furthermore, the libraries staff and lecturers were asked whether the layout of the library buildings allow students with visual impairments to access information resources domicile in the library without difficulty, Responses were again elicited on a 5-point Likert scale (5=strongly agree, Agree = 4, Undecided =4, Disagree =2 and strongly disagree =1) presents in the Table 4.13.

Table 4.13: Layout of the Library Buildings (N= 33)

Statement	**SA**	**A**	**U**	**D**	**SD**
Library buildings layout in UR does not allow VIS easy access to the information resources in the library	7(21.2%)	13(39.4%)	3(9%)	7(21.2%)	3(9%)
The three campuses of UR had no functioning lifts and ramps which enable VIS to access information resources in the library	7(21.2%)	17(51.5%)	3(9%)	3(9%)	3(9%)
Library buildings in UR are unsuitable for the mobility needs of VIS	10(30.3%)	12(36.4%)	3(9%)	5(15.2%)	3(9%)
Library buildings in UR have no rail-marks for easy identification and protected embankments	12(36.4%)	13(39.4%)	2(6.1%)	5(15.2%)	1(3%)
The design of the UR library buildings does not provide easy access for VIS	15(45.5%)	10(30.3%)	3(9%)	3(9%)	2(6.1%)

As shown in table 4.13, a cumulative total of 60.6% respondents agreed that library buildings layout in libraries does not allow VIS easy access to the information resources in the library, while only 30.2% disagreed.

A cumulative total of 72.7% respondents agreed that the three campuses of UR had no functioning lifts and ramps which enable VIS to access information resources in the library while only 18% disagreed. Regarding on whether Library buildings in UR are unsuitable for the mobility needs of VIS, 66.7% agreed 24.2% disagreed.

On whether the Library buildings in UR have no rail-marks for easy identification and protected embankments, a cumulative total of 75.8% agreed while a cumulative total of 18.2% disagreed. Concerning whether the design of the UR library buildings does not provide easy access for VIS, 75.8% agreed while a cumulative total of 15.1% disagreed.

These results indicate all items pertaining to the layout of the library buildings allows people with visual impairments to access the information resources housed in the library were significant. These results imply that all the three University of Rwanda campuses investigated has no functioning facilities that enable students with visual impairments to access information resources or services in the academic libraries.

4.6 How Needs of the VIS are Met at the University of Rwanda Libraries

The fourth objective of the study was to determine whether the Information needs for visually impaired students were meet up by the university Rwanda library. Information needs of visually impaired students as a variable was operationalized using information needs brackets. Information needs was deemed relevant to the determinants of access to

university library among visually impaired students within the three campuses of University of Rwanda. The respective descriptive statistics were calculated and the results tabulated in table 4.14.

Table 4.14: Meeting the Information Needs for Visually Impaired Students (N= 64)

Information needs of VIS	**N**	**Achieved**	**%**	**Not Achieved**	**%**
Media sources	64	24	37.2	40	62.8
Newspapers in Braille	64	-	0.0	-	100.0
Radio	64	13	20.0	51	80.0
On-line resources including the internet	64	-	0.0	-	100.0
Periodical database	64	4	6.7	60	93.3
Media-formats for VIS	64	20	30.7	44	69.3

As shown from the table 4.14, it has been found out that the most important information need such as media sources, newspapers, television, or radio, periodical database, media-formats for VIS and on-line resources including the internet Information need for visually impaired are not met by the university as attested by majority of the respondents of the visually impaired students, library staff and lecturers and dean of students from each of the three campuses of University of Rwanda.

4.7 Challenges Experienced by the Visually Impaired Students in Accessing and using Information at the University Libraries

The final objective of the study was to determine the challenges experienced by the visually impaired students in accessing and using information at the university libraries. The data on rating of the challenges faced by the visually impaired students in accessing and using information at the University of Rwanda were collated and analyzed using frequency counts and percentages. The findings are presented in Table 4.15.

Table 4.15: Rating of the Challenges Faced by the VIS in Accessing and Using Information at the University of Rwanda Libraries

Challenges	N	Agree	%	Disagree	%
Lack of appropriate book formats for VIS	64	-	100.0	-	0
Inadequate facilities such as well furnished Special rooms for VIS	64	62	96.9	2	3.1
Inadequate funding to provide VIS equipment	64	61	95.5	3	4.5
Inability of Library to provide Braille in form of tactile communication	64	55	86.2	9	13.8
Access-friendly external environment	64	55	85.4	9	14.6
Accessible services and facilities	64	48	75.6	16	24.4
ICT technology in the library is inappropriate for VIS	64	54	83.7	10	15.3
Students with visual impairment depend in readers to read	64	57	89.1	7	10.9
Braille embossers, screen magnification and JAWS are not available	64	56	87.8	8	12.2
Library staff negative attitudes	64	48	75.2	16	24.8
Policy environment relating to library services provision for VIS	64	47	72.9	17	27.1

As indicated in Table 4.15, all the respondents (100 %) claimed that the most notable challenges faced by the VIS in accessing and using information at the University of Rwanda libraries were the Lack of appropriate book formats for VIS. In like manner (96.9%) of the respondents reported that inadequate facilities such as well-furnished Special rooms are major constraints for VIS towards the effective usage and accessing information at the University of Rwanda librarie**s**. Other challenges include inadequate funding to provide VIS equipment (95.5%), inability of Library to provide Braille in form of tactile communication (86.2%), access-friendly external environment (85.4%), accessible services and facilities (75.6%), ICT technology in the library is inappropriate for VIS (83.7%), students with visual impairment depend in readers to read (89.1%), Braille embossers, screen magnification and JAWS are not available (87.8%), library staff negative attitudes (75.2%) as well as Policy environment relating to library services provision for VIS (72.9%).

In Table 4.15, the findings show that most of the respondents attested to the presence of challenges by the visually impaired students (85.9% average response rate). Perhaps their viewpoint reflected the stress associated with juggling multiple responsibilities at once. It is possible that the university could offer an introductory class that can help visually impaired student to prepare for accessing and use of information in Libraries.

For this study, students with visual impairments encountered specific challenges in the visual access and use of information at the University of Rwanda Libraries, including technical, institutional and personal issues. While accessing and use of information in

Libraries, technical challenges arose that were problematic to resolve. It is likely that the cause of these issues was due to the accessibility of the library platform and website or the compatibility of the screen reader, screen magnification and JAWS. In addition to the technical problems, the students with visual impairments felt neglected or isolated when dealing with the institution, libraries staff or the faculty members. The lack of support from library staff and institutional support was daunting. The libraries and technical support staff should also be familiar with a variety of assistive technology so that they might be able to lend more specific support for visually impaired students accessing and use of information in Libraries. Institutions of higher learning should encourage their technical staff to become familiar with assistive technology so that people with visual impairments will be able to receive the technical assistance they need when taking while accessing and use of information in libraries.

4.8 Chapter Summary

The chapter provided an analysis and interpretation of data collected through questionnaires and interviews from Visually Impaired Students, library staff, dean of students and lecturers in Huye Campus, CE (Remera Campus), CBE (Gikondo Campus) at University of Rwanda. From the proceeding analysis and interpretation of the collected data it can be argued that most of the respondents in the study sample were in agreement that there are no adequate Information sources at the UR Libraries for the Visually Impaired Students. Findings show that the inadequacy of appropriate information resources and required reading equipments at the UR libraries and the absence of alternative information resources within the university campuses have forced majority of

the Visually Impaired Students to resort to normal print information resources. Lack of assistance on how to use the limited available software for reading has resulted in low use of the library information resources by these students. The university only provides few Braille machines to be shared amongst the students.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

Drawing from the findings of this study as shown in the previous section, this section provides a systematic discussion of these findings in light of the theoretical and empirical literature. Section 5.2 provides demographic characteristics of the respondents in the study. Section 5.2.1 discusses the findings relating to the first objective of the study and corresponding research question one, which posited; which information resources are available at the University of Rwanda Libraries for the visually impaired students. Section 5.2.2 discusses findings related to the second objective of this study and accordingly the corresponding research question two, which premised on; how do the visually impaired students access and use information materials at the University of Rwanda Libraries. Section 5.2.3 discusses the third objective of the study and the corresponding research question three which posited; what are the facilities and support system provided to assist visually impaired students at the University of Rwanda Libraries to access and use information. Section 5.2.4 discusses the fourth objective of the study and the corresponding research question four which posited; Are the information needs of visually impaired students met. Section 5.2.5 discusses the fifth objective of the study and the corresponding research question four which posited; what are the challenges experienced by visually impaired students in accessing and using information at the University of Rwanda Libraries**.**

5.1 Summary of the Findings

The purpose of the study was to investigate the access and use of information by visually impaired students at the University of Rwanda Libraries with a view to develop strategies that can be used to improve access and use of information by visually impaired students at the University of Rwanda**.** The findings of this work have been derived from the objectives and answers to the research questions. The responses to these questions are provided through the analysis of the collected data: The following summary of the findings were made. The studies have indicated a variety of background demographic characteristics of the respondents. This include: distribution of VIS, library staff experience in the University of Rwanda, services available for visual impairments students, availability of trained and experienced staff and layout and structures of the library buildings. In addition, the chapter discusses the study findings thematically in line with the study objectives and in reference to existing literature. Analysis of the respondents' questionnaire responses revealed the following findings.

5.1.1 Information Sources Available at the UR Libraries for the VIS

The study identified Information sources available at the University of Rwanda Libraries for the visually impaired students. Based on the study findings from the three campuses, majority of the respondents comprises of VIS, Library staff, Campus deans of students and lecturers responded negatively. (see 4.3).

Furthermore, the findings show that the three campuses of University of Rwanda are deficient in the availability of library and information services for the VIS. Though, the three campuses have Braille printers, Braille Books and audio books, almost all the three campuses did not have talking newspapers, deficient in the availability of talking books and assistive technologies. (see table 4.6).

The findings confirm the finding of Tungaraza (2010) who noted that students with visual impairments at the University of Dar es Salaam depend on readers to read for them since the library does not have books in Braille. In a similar finding of Kaijage (1991), Ndumbaro (2009), Bagandanshwa (1998), Shunmugam (2002) and Ochoggia (2003); they concurred with the above findings that there are no information resources in optional design for students with visual impairments in the academic libraries of higher institutions of third world countries.

It was observed in another study of Atinmo (1979) that enumerated services for the visually impaired in school and public libraries in Nigeria are inadequate. He reveals that Nigeria have inadequate library services and that libraries often fail to have specific, special provisions that encourage the visually impaired students to use the library. Besides Atinmo, other more recent studies such as Tinerella and Dick (2005), McIntyre (2004), Karen (2003), Levitt (2000) and Devadason (1996) have revealed that students with visual impairments need special attention in terms of service provision in libraries due to the fact that visually impaired students exhibit a spectrum of special needs as a result of their sensory limitations Regrettably, University of Rwanda, like most

Universities in Africa, has one of the world's poorest library facilities for visually impaired students. The findings imply that there is an urgent need to improve the existing level of library and information services available to the visually impaired students in the three campuses of University of Rwanda.

5.1.2 Extent to which VIS Access and use Information Materials at the UR Libraries

The study establishes the level of usage of information materials at the UR Library by VIS. Based on the study findings from Huye Campus, majority of the visually impaired students and library staff indicated low levels of access and use of information materials for visually impaired students at the University of Rwanda Libraries. In the same situation, majority of the virtually impaired students indicated low level of access and use of information materials. In the same college, majority of the library staff indicated low levels of access and use of information respectively. Meanwhile at the College of Education Remera Campus virtually impaired students and library staff attested low level of access and use of information materials. In the College of Business and Economics Gikondo Campus, majority of the visually impaired students reported low levels of access and use of information materials in the library. Moreover, majority of the library staff members reported low levels of access and use of information for visually impaired students in the library.

The findings show that most of the respondents believed that access to information at the library was low. Majority of the respondents also attested that books published worldwide are not availed to the visually impaired students, lack of information by the

visually impaired students due to negative stereotyping. Finally, these findings clearly show that in the three campuses of UR many visually impaired students may not have the capacity to use information resources even if they are available in the library. (See table 4.7, table 4.8 and figure 4.1).

The findings consistence with the study of Bagandanshwa (1998) who observes that the library buildings in most cases are unsuitable for the mobility needs of people with visual impairments students. These views imitate the findings of Kaijage (1991), Ndumbaro (2009) and Leong and Higgins (2010) that observed that the design of most library buildings does not provide easy access for students with visual impairments. The finding is consistent with other findings Onatola (2007) and Nicholson (2012), which demonstrated that only four African countries had enacted legal provisions for visually impaired students with sensory limitations into their national copyright law.

5.1.3 Facilities and Support System Provided to Assist VIS at the UR Libraries

Regarding the facilities and support system provided to assist visually impaired students at the University of Rwanda Libraries, the results of the findings show that majority of the respondents indicated that they strongly disagreed with the notion that the facilities and support system provided by University of Rwanda are sufficient enough to enhance access to information in the library among the visually impaired students. Furthermore, the finding, attested by students in the three campuses of University of Rwanda show the essential facilities and support system of VIS available at the university library are few. (See Table 4.9 and figure 4.2)

Furthermore, the findings show that the three campus of University of Rwanda are deficient in the availability of library materials for the visually impaired students. Although the three campuses of University of Rwanda have few JAWS, scanners and magnetic glasses, almost all the three campuses did not have enough Braille equipments, audio books computer programs, screen magnification monitors, screen readers, digital audio book, Braille, large print and special rooms to assist visually impaired students in the usage of library. (See table 4.10).

In addition, the findings also showed that staff that provide services to people with visual impairments are not trained to meet special needs of students with visual impairments. Respondents added that the library programmes and curricula of most universities do not include essential module on special needs for students with visual impairments. The respondents that responses positively point out that academic library do have trained and experienced staff that assist students with visual impairments **(see 4.5.2).** Moreover, the findings indicate that the majority of respondent indicated that access for students with visual impairments did not facilitated by layout of library buildings. (See 4.5.3).

This finding concurs with the findings of Ndumbaro (2009) who observed that in Tanzania, that libraries layout, structure, accessibility, library and information services are planned without considering the needs of people and students with visual impairments. This was further revealed in the study by Bagandashwa (1998) that efficient and effective library services for people and students with visual impairments are considerably lacking in Tanzania higher institutions of learning.

In addition, this study finding is consistence with the findings of Alemna & Dodoo (2003), Bodaghi and Zainab (2012) and Kaijage (1991) that observe that in most African countries, library and information services to people with visual impairments are almost non-existent due to untrained staff that are unable to assist people with visual impairments. There is a lack of properly trained library personnel in most library schools in Africa due to curricula that are geared towards conventional librarianship courses.

5.1.4 Extent to which the Needs VIS are met at the UR Libraries

Regarding whether the Information needs for visually impaired students was meeting up by the University of Rwanda Libraries. The findings show that information need for visually impaired are not available to the university as demonstrated by majority of the students from each of the three campuses of university investigated. The findings show that University of Rwanda's library service provision to visually impaired students was in sympathetic situation. The finding further revealed that most important information need such as media sources, newspapers, television, or radio, periodical database, media-formats for VIS and on-line resources including the internet are not met by the university as attested by majority of the respondents of the visually impaired students, library staff and lecturers from each of the three campuses of University of Rwanda. (See table 4.14).

This finding is supported by Fullmer and Majumder (1991), who argue that because knowledge is power, access to information (which is the foundation of knowledge) and the ability to use it gives a person the chance to choose from many alternatives, rather than being limited to a few undesirable and limited choices. Therefore, visually impaired

students require access to information in accessible formats, such as Braille and large print, among others. This is supported by Adetoro (2011) and the American Foundation for the Blind (2013) who emphasize that write down information into accessible formats is the only way to make information useful to the visually-impaired.

5.1.5 Challenges Experienced by VIS in Accessing and Using Information

The study sought to determine the challenges experienced by the visually impaired students in accessing and using information at the University of Rwanda libraries. The findings show that majority of the respondents rated the challenges faced by the visually impaired students in accessing and using information at the University of Rwanda libraries to be high. Perhaps their viewpoint reflected the stress associated with juggling multiple responsibilities at once. The findings show that most of the respondents in the study sample were in agreement that students with visual impairments encountered specific challenges in the visual access and use of information at the University of Rwanda Libraries, including: technical, institutional and personal issues.(See table 4.15).

These findings are consistent with the findings by Kaijage (1991); Ndumbaro (2009); Bagandanshwa (1998), (Ochoggia 2003) and (Shunmugam 2002). All of the abovementioned authors cite resource and capacity constraints as the reason for lack of accessible formats of information for the Visually Impaired Students in their respective research findings. The findings concur with those of Bodaghi and Zainab (2012) claims that there is a lack of policies, procedures or guidelines that cater for the needs of people and Visually Impaired Students. This was further revealed in the study by UNESCO

(1997) that only a few universities have a written policy regarding disabled students most especially those with sensory limitations. And that the national policy is not clear on the availability of library and information services for those with sensory limitations such as people and visually impaired students.

5.2 Conclusion

Arising from the research findings, the following conclusions were drawn:

Firstly: the findings show that most of the respondents in the study sample were in agreement that there are no adequate Information sources at the University of Rwanda Libraries for the visually impaired students. The findings conclude that there are no alternative information resources for students with visual impairments in University of Rwanda Libraries and therefore students with visual impairments use normal print information resources for which the University of Rwanda employ readers who read for them. These readers are either only a few in numbers or completely lacking in all academic libraries investigated.

Secondly: The study conclude that majority of the respondents agreed that the visually impaired students had low levels of access and use of information materials at the University of Rwanda Libraries. The study also concluded that most of the students, academic staff and library staff believed that access to information at the library was low.

Thirdly: the findings show that most of the respondents in the study sample were strongly disagreed with the notion that the facilities and support system by University of Rwanda

Libraries are sufficient enough to enhance access to information in the library by the visually impaired students. Furthermore, the findings show that the three campuses of University of Rwanda are deficient in the availability of library materials for the visually impaired students. The three campuses of University of Rwanda have few JAWS, scanners and magnetic glasses, but deficient in Braille equipments, audio books computer programs, screen magnification monitors, screen readers, digital audio book, Braille software, large print and special rooms. The study also concluded that library staff that provide services to people with visual impairments are not trained to meet their special information needs. Moreover, the study specified that the majority of respondent indicated that access to the information for students with visual impairments did not facilitated by layout of library buildings.

Fourthly: the study concluded that information need for visually impaired students are not met by the University of Rwanda Libraries as attested by all the visually impaired students from each of the three campuses of University of Rwanda. The finding concludes that University of Rwanda has no data or library service policy guideline on the visually impaired students.

Finally: The findings show that the rating of the challenges faced by the visually impaired students in accessing and using information at the University of Rwanda libraries attested to the presence of challenges by the visually impaired students. The study conclude that most of the respondents in the study sample were in agreement that students with visual impairments encountered specific challenges in the visual access and use of information, including: technical, institutional and personal issues.

5.3 Recommendations

In view of the above mentioned discussions, implications and conclusions highlighted above, the study generated recommendations for different stakeholders to improve access and use of information by the visually impaired students at the University of Rwanda Libraries. The researcher suggests the following recommendations based on the findings of the research:

1. The findings showed that there were no adequate alternative information resources suitable for VIS nor adequate readers. The study therefore recommends the acquisition of ICT equipments to facilitate specialized library services for VIS, customization of information services for the visually impaired, as well as converting information resources into the formats suitable for people with visual impairments, such as Braille equipments, audio books computer programs, screen magnification monitors, screen readers, digital audio book, Braille software, In addition, the study recommends that the UR should employ librarians and lecturers with solid Braille literacy skills to serve the VIS.

2. The study indicates low level of access and use of information materials by Visually Impaired Student at UR heighted by the poor structure of the library building that has no provision for the visual handicapped. Therefore, the study recommends that library be redesigned to accommodate the physical disabilities of visually impaired.

Further the study establishes the need for trained staff in special needs of physically challenged library users. Therefore the study recommends recruitment and training of library staff who can serve students with special needs in all campuses.

3. The study established that the three campuses did not have any library policy guiding the provision services to VIS. Consequently the study recommends the adoption of policies addressing library services for students with visual impairments, as well as the allocation of adequate funds to support learning activities for the visually impaired.

4. Visually impaired students demonstrate a range of special needs as a result of their sensory limitations, exemplified by their differences in personality including capabilities, attitudes, learning techniques and motivation. Therefore, the study recommends a one on one library support and monitoring of these students.

5.4 Suggestion for Further Research

During this study, certain areas were identified that can provide opportunities for further research such as:

a) Researchers may also consider expanding this research beyond the academic realm. It may also be important to see how visually impaired individual outside academic environment locate relevant information. For example, it may be interesting to learn how visually impaired professionals gather information for their work.

b) There is need for further investigation on the activities of bibliographic instruction, information and computer literacy for the visually impaired students.

c) The study was done on the public university. Every organization has its uniqueness on culture, staff, structure, resources and the environment it operates in different from others. It is therefore recommended that the same study be undertaken among the private universities operating in Rwanda in order to determine the access and use of information by the visually impaired students in the universities and comparison be made.

REFERENCES

Adetoro, N. (2011). Availability and use of information materials by persons with visual impairments in Nigeria. Information, society and justice, 4(2): 5-18.

Alemna A. A. and Dodoo, V. 2003. An assessment of library services for the visually handicapped in Ghana. *Journal of Association of Libraries for the visually impaired* 2.1:32-35.

American Foundation for the Blind. (2013). Educational interventions for students with low vision. www.afb.org/section.aspx

Atinmo, M.I. 1979.Public and school library services to the physically handicapped in Nigeria: an evaluation. *International Library Review*. 11.4:441-449.

Atkinson, M. T. and Dhiensa, J. (2007). Improving library services to people with print disabilities: the role of technology in public libraries In Improving library services to people with disabilities. C. Deines-Jones, Ed. Oxford: Chandos Publishing. 1- 20.

Babalola, Y. T. and Haliso, Y. (2011). Library and information services to the visually impaired: the role of academic libraries. Canadian social science, 7(1): 140-147.

Bagandanshwa, E.T.T. 1998. Library services for visually impaired and blind people in Tanzania. Huria: journal of the Open University of Tanzania, 2(1): 53-59.

Bagandanshwa, E.T.T. (2006). Technologies deployed by visually impaired and blind people in Tanzania to access information. Journal of issues and practice in education, 1(1): 79-87.

Balini, B. (2000). A Needs Assessment of CNIB Library Services. University of Alberta, (April, 12):25.

Benedict A (2013). Public Citizen welcomes the Marrakesh Treaty for the Blind. Available at: www.citizenvox.org Marrakesh-treaty-for-the-blind.

Berg, L.B. (2001). Qualitative Research Methods for Social Sciences

Bodaghi, N. B. and Zainab, A. N. 2012. Accessibility and facilities for the disabled in public and university library buildings in Iran. *Information development*, 29(3): 241-250.

Brophy, P. Craven, J (1999). The integrated accessible library, a model of service development for the 21th century: the final report of the REVIEL Project. Manchester, CERLIM.

Carson, D., Gilmore, A., Perry, C. and Gronhaug, K., 2001. *Qualitative Marketing Research*, Sage Publications, London.

Charlton, I. James (2000). Nothing about us without us. Disability, oppression and empowerment. California: University of California Press.

Copyright Amendment Bill (2010) for blind persons, Government press, Republic of Malawi

Creaser, C., Davies, J.E., and Wisdom, S. (2003). Accessible, open and inclusive? How visually impaired people view library and information services and agencies. Journal of Librarianship and Information Science, 34 (4).

Creswell, J. W. (2003). Research design: Qualitative, quantitative, and mixed methods approaches. Thousand Oaks, CA: Sage.

Croft, A. (2010). Including disabled children in learning: challenges in developing countries. CREATE: University of Sussex.

Dearing, R. (1997). Higher education in the learning society (the Dearing Report). London, National Committee of Inquiry into Higher Education.

Deines-Jones, C. (Ed.) (2007). Improving library services to people with disabilities. Oxford: Chandos Publishing.

Denzin, N. (2005). The Research Act: a Theoretical Introduction to Sociological Methods. Prentice Hall, New Jersey.

Devadason, S.1996. A new vista on library services to the visually impaired in developing counties of Asia: a Malaysian paradigm. *Singapore Libraries.* 25.2: 23-33

De Witt, A. (2004). There are still problems with Daisy. BibliotheekBlad , 8(5/6), pp. 28-29.

Dick, AL. (2006) Whose model, what context? Cultural bias and the nested model of context stratification for information seeking and retrieval. Paper presented at the World Library and Information Congress: 72nd International Federation of Library Associations and Institutions (IFLA) General Conference and Council, 20–24 August, Seoul, Korea.

Dragoicea, M., Sacala, M.D., Cojocaru, A., Shivaron, N. and Balan, C. (2009). Designing mobile assistive technologies in the model driven development framework. Proceedings of the 1st International Conference on Manufacturing Engineering, Quality and Production Systems. Romania: Transilvania University of Brasov.

EENET (2003). Challenging the exclusion of blind students in Rwanda. http://www.eenet.org.uk/resources/eenet_newsletter/news7/page4.php

EIFL. (2013) Why a WIPO Treaty for Persons with Print Disabilities can change lives: DAISY readers in Mongolia a legal right - now copyright law must play its part. Available at: www.eifl.net/why-wipo-vip-treaty-can-change-lives-mongolia.

Etheridge, D. T. and Mason, H. (eds). 1994. *The visually impaired: curricular access and entitlement in further education.* London: David Fulton.

Eymard, D. (2002). Libraries and the visually handicapped. Bulletin des Bibliotheques de France; 47 (2), p.117-19

Facts & Figures (2015) (PDF). University of Rwanda Statistics Office. January 2015, Retrieved 15 October 2016

Fourie, I. (2010) Interpreting the information behaviour of patients and families in palliative cancer care: a practical approach. *Innovation* 40:34–46.

Fraenkel, J. & Wallen, N. (2006). How to design and Evaluate Research in Education (4th ed). Boston, MA: McGraw-Hill.

Friend, C. 2009. "Meeting the Needs of the Visually Impaired Persons: What Challenges for IP?" Paper presented at a meeting hosted by WIPO in Geneva, Accessed July, 2013. At www.wipo.int

Fullmer, S. and Majumber, R.K. (1991). Increased access and use of disability related information for consumers. Journal of Rehabilitation, 57, July-September, 17-22.

Gall, K., (2007), Educational Research; An Introduction 8th Edition. New York, USA

Goddard, M. (2004). Access through technology. Library Journal; Spring Net Connected Supplement, Apr, pp. 2-6.

Gunde, M.G. (1991). Every librarian should know about the Americans with Disabilities Act. American Libraries, 22(8):380-398. http://www.jstor.org/ stable/25632347

IFLA. (2005). Guidelines for Libraries. Available at www.ifla.org/copyright-issues-for-libraries.

IFLA. (2013). Copyright Issues for Libraries for the blind. Available at: www.ifla.org/copyright-issues-for-libraries.

Herriot, T.K. 2006. An increasingly diverse student population: a rationale for consideration of universal access at postsecondary institutions. Improving the quality of library services for students with disabilities. Eds. P. Hernon & P. Calvert. Westport, CT: Libraries Unlimited.

Kaijage, J.J.L. (1991). An assessment of library and information services for the visually impaired: with particular reference to information needs of visually impaired university students and information plans for Tanzania. Master's dissertation. University College of Wales.

Karangwa, E. (2008). Inclusive higher education in Rwanda: the story continues. EENET Newsletter 12. Manchester, Enabling Education Network. www.eenet.org.uk/resources.

Karen, H. 2003. Developing accessible library services. *Library + Information Update*. 2.11:50-52

Kavanagh, R. (2005). Transforming Libraries for the Blind in the Learning Culture of the Information Age: The Role of the International Federation of Library Association (IFLA) and the World Blind Union (WBU). World Blind Union. Fifth General Assembly Information. www.cnib.ca/eng/national/wbu/wbu

Kharamin, F. and Siamian, H. (2011). The survey of public library services for visually impaired and blind in public libraries: case study of Mazandaran province librarian, Iran. Singapore: International Association of Computer Science and Information Technology (IACSIT) Press.

Kothari, C.R. (2009). *Research Methodology: Methods and Techniques*. New Delhi: Willey Eastern Ltd.

Kothari, C. R. (2004). *Research Methodology: Methods and Techniques (Second Revised Edition)*. New Delhi: New Age

Kwibuka, Eugène (2013). "Profile: Who is who at University of Rwanda". The New Times. Retrieved 7 April 2015. (Archive

Lancaster, S., Mellard, D. and Hoffman, L. (2001) Experiences of students with disabilities in selected community and technical colleges. the individual accommodations model: accommodating students with disabilities in post-secondary settings. University of Kansas, Center for Research on Learning: www.das.kucrl.org/iam/reports.html.

Lee, Y.S. (2007). Finding the means to improve services In Improving library services to people with disabilities. Deines- Jones, C. Ed. Oxford: Chandos Publishing. 105-122.

Leedy, P (2003) Practical Research Planning and design 6th Edition Columbus

Leong, I.C.B. and Higgins, S.E. 2010. Public library services for wheelchair-bound young people in Singapore. London: Routledge

Levitt, T.2000. Everybody's right to access. *Public Library Journal*. 15.4:115-116

Lynch, P. 1994. Supporting services in an integrated setting. In Etheridge, D. T. and Mason, H. (eds.) *The visually impaired: curricular access and entitlement in further education.* London: David Fulton.

MacGregor, Karen (2014). "A new university, new international leader, new future". University World News (325). Retrieved 7 October 2016

Machell, J. (1996). Library and Information Services for visually impaired people: national guidelines. London: Library Association Publishing.

Maduagwu, D. K. and Ojewande, K. A. 2006. Library and information services for people with special needs. *The special Educator* 5.1: 81-85.

Marrakesh Treaty to Facilitate Access to Published Works for Persons who are Blind,Visually (2013) Impaired, or otherwise Print Disabled: www.wipo.int/meetings.

McIntyre, A.M. 2004. Public library services for children with special needs. *Rural Libraries*. 24.2:21-31

Meekosha, H. (2008). Contextualising Disability: developing southern/global theory. Keynote paper given at 4th Biennial Disability Studies Conference, Lancaster University, UK. http://www.wwda.org.au/meekosha2008.htm

Mugenda, O.M. and Mugenda, A.G. (2003) Research Methods; Quantitative & Qualitative Approaches. Acts Press, Nairobi, Kenya.

National Library Service for the Blind and Physically Handicapped (2005) *Magazines in Special Media* Vol 64, No.1 (HTML at loc.gov)

Natsis Y (2013). Simple introduction to the Marrakesh Treaty for Visually Impaired. Available at: http://tacd-ip.org/archives/1047.

Ndumbaro, R. (2009). Library and information services provision for people with visual impairment in selected university and public libraries in Tanzania. Master's dissertation. University of Dar es Salaam.

Neuman, W. Lawrence. (2000). Social Research Methods: Qualitative and Quantitative Approaches. Fourth Edition. Boston.

Nicholson DR (2012). Accommodating Persons with Sensory Disabilities in South African Copyright Law. Masters dissertation, University of the Witwatersrand, Johannesburg. Available at: http://wiredspace.wits.ac.za/handle/10539/12525.

Nicholson DR (2006). Copyright - Are people with sensory-disabilities getting a fair deal? Available at: http://pcf4.dec.uwi.edu/viewabstract.php?id=379.

Nnadozie, C. O. (2006). Information needs and information seeking behavior of visually handicapped persons in Owerri, Nigeria. *The Research Librarian: Journal of the Nigerian Library Association Abia State*. 1.1: 116-131.

Ochoggia, R.E. (2003). Persons with Disabilities Bill 2002: implications concerning visual disabilities for academic library and Information Services in Kenya. New Library World, 104(1190/ 1191): 307-312.

Official Gazette of the Republic of Rwanda (2013) (Igazeti ya Leta ya Repubulika y'u Rwanda/Journal Officiel de la République du Rwanda). Republic of Rwanda Office of the Prime Minister. 23 September 2013. p. 39. Retrieved 8 April 2015.

Ogba, U. 2000. Library and Information services to the visually and physically handicapped in Library for the handicapped, Imo State Library Board, Owerri, *Journal of Association of Libraries for the Visually Impaired* 1.1:10-14.

Oliver, M. (1990). The politics of disablement: a sociological approach. New York: St. Martin's Press.

Onatola, A. 2007. Reaching people with disabilities in developing countries through academic libraries. In Improving library services to people with disabilities. Deines-Jones, C. Ed. Oxford: Chandos Publishing. 87-104.

Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: SAGE.

Paul, S. (2000). Students with disabilities in higher education: a review of the literature, College Student Journal, 34, 200–210.

Paul Harpur (2013) 'From universal exclusion to universal equality: Regulating Ableism in a Digital Age' (2013) 40 Northern Kentucky Law Review 3, 529-565

Payne, A., & Singh, V. (2010). Open source software use in libraries. Library Review, 59(9), 708-717.

Pettigrew, K.E. and McKechnie, L. (2001). The use of theory in Library and Information Science research. *Journal of the American Society for Information Science and Technology*, 52(1): 62-73.

Principles of Universal Design Version 2.0 (1997). Design.ncsu.edu. *Retrieved 2016-10-14*

Republic of Rwanda, (2003). The national constitution of the Republic of Rwanda. Kigali: Prime Minister's office.

Robertson, L. (2012). Access for library users with disabilities. www.sconul.ac.uk/content/access-library-users-disabilities

Ronald L. Mace (1963) On NC State University, College of Design". Design.ncsu.edu. Retrieved 2013-07-26.

Rose D and Meyer A, (2002). Teaching Every Students in the Digital Age: Universal Design for Learning Association for Supervision and Curriculum Development, Alexandria, WA

Rossman, G. & Rallis, S. (1998). *Learning in the field: An introduction to qualitative research.* Thousand Oaks, CA. Sage Publications, Inc.

Rutayisire, Emmanuel (2013). "Institutes of higher learning to merge with University of Rwanda". The East African. Retrieved 7 April 2015

SAMRO. (2013). DALRO's Response to the Signing of the Marrakesh Treaty on 27 June 2013. Available at: http://www.samro.org.za/node/10778.

Saunders, M., Lewis, P. & Thornhill, A. (2007). Research methods for business for Students: 4th edition. Pearson Education Limited Artes Graficas.

Shava, K. (2008). How and in what ways can western models of disability inform and promote the empowerment of disabled people and their participation in mainstream Zimbabwean society? Master's dissertation. University of Leeds.

Shunmugam, M. (2002). An exploration of the barriers, as experienced by visually impaired students studying at the University of Natal. Master's dissertation. University of Natal.

Sridhar, M.S (1995). Understanding the user-Why, What and How? *Library Science with a Slant to Documentation and Information Studies. 32(4),* 151-164.

Tank, E. (2000). The Digital Society's Challenge to the Library for the Blind. IFLA Publications, 102, 167-172.

Taylor, R.S. (1968). Question-negotiation and information seeking in libraries. *College and Research Libraries*, 29(3): 178-194

Tilley, C.M., Bruce, C.S. and Hallam, G. 2007. Adaptive technology for people with physical disabilities using information and communications technology In *Improving library services to people with disabilities*. Deines-Jones, C. Ed. Oxford: Chandos Publishing. 65-86.

Tinerella, P. & Dick, M.A. 2005. Academic reference service for the visually impaired: a guide for the non-specialist. *College and research libraries news*. 66.1:29-32

Tinker, A., Mccreadie, C., and Salvage, A. (1993). The Information Needs of Elderly People –An Exploration Study. London. Age Concern Institute.

Tinklin, T., Riddell, S., and Wilson, A. (2004). Policy and provision for disabled students in higher education in Scotland and England: the current state of play. Studies in Higher Education, 29 (5):637-657.

Todaro, A.J. (2005). Library services for people with disabilities in Argentina. New library world, 106(1212/1213): 253-268.

Tungaraza, F.D. (2010). Accomplishments and challenges facing students with disabilities at the University of Dar es Salaam: thirty years of navigating the hill. Paper in education (PED). 29. Dar es Salaam: University of Dar es Salaam.

United Nations (2006). Convention on the Rights of Persons with Disabilities. New York

United Nations Educational, Scientific and Cultural Organization. (1997). Disabled students at universities in Africa. Harare: UNESCO.

UNESCO (2005). Guidelines for inclusion: ensuring access to education for all. http://unesdoc.unesco.org/images/0014/001402/140224e.pdf

Veer, L.D. (1996). Talking books for the general public: more cooperation between public libraries and libraries for the blind (required). Bibliotheek en Samenleving; 24(10), pp. 14-17.

Wall, P. and Sarver, L. (2003) Disabled student access in an era of technology. Internet and Higher Education 6: 277–284.

West, M., Kregel, J., Getzel, E.E., Zhu, M., Ispen, S.M., & Martin, E.D. (1993). Beyond section 504: Satisfaction and employment of students with disabilities in higher education. Exceptional Children, 456-467.

WHO. (2012). Visual impairment and blindness. WHO Fact Sheet 282. Available at: www.who.int/mediacentre/factsheets/fs282/en

Wilson, TD. (1999) Models in information behaviour research. *Journal of Documentation* 55(3):249–270.

World Intellectual Property Organization *(2015*) Notifications: Marrakesh VIP Treaty" Retrieved 15 October 2016.

APPENDICES

APPENDIX A: INFORMED CONSENT LETTER

Dear Respondents,

I am a post graduate student at Moi University. It is a requirement of the course to carry out a research project. I am soliciting for information on the topic "access and use of information for visually impaired students at the university of Rwanda libraries". I kindly request you to answer the questions below. This research is purely academic and any information provided shall be treated with confidentiality. Kindly participate and respond appropriately to the questions given below. Your contributions are highly appreciated.

Thank you very much in advance.

Yours sincerely,

UMUTESI ANNONCIATTE

IS/MSC/LIS/29/013

APPENDIX B: QUESTIONNAIRE FOR LIBRARY STAFF

I am a post graduate student at Moi University. It is a requirement of the course to carry out a research project. I am soliciting for information on the topic "access and use of information for visually impaired students at the University of Rwanda libraries". This research is purely academic and any information provided shall be treated with confidentiality. Kindly participate and respond appropriately to the questions given below. Your contributions are highly appreciated.

Thank you very much in advance.

Questionnaire Number……Date of interview……

SECTION A: PERSONAL DATA

1. Library/Institution:

   Huye Campus [ ] College of Education [ ]

   College of Business and Economics [ ]

2. How long have you served in the visually impaired section of your library?

   a. Less than 2 years ( )
   b. 2 – 5 years ( )
   c. 5 – 10 years ( )
   d. From 10–less than 15 years ( )

3. Does your library provide services to visually impaired persons? Yes ( ) No ( ).

4. Do you have trained and experienced staff that assist users with visual impairments in the use of library services? Yes ( ) No ( ).

5. Please indicate whether you strongly agree (SA), agree (A), are undecided (U), disagree (D), or strongly disagree (SD) with the following statements on whether the layout of the library buildings allow students with visual impairments to access information resources domicile in the library without difficulty

Item	Issues	SA	A	U	D	SD
1	Library buildings layout in the UR does not allow VIS easy access to the information resources in the library					
2	The three campuses of UR had no functioning lifts and ramps which enable VIS to access information resources in the library					
3	Library buildings in UR are unsuitable for the mobility needs of VIS					
4	Library buildings in UR have no rail-marks for easy identification and protected embankments					
5	The design of the UR library buildings does not provide easy access for VIS					

SECTION B: SPECIFIC RESEARCH QUESTIONS

1. Sources of information available at the university libraries forVIS

Information sources	Tick appropriately
University internet	
word of mouth	
None	

2. List the information sources available to visually impaired students in University of Rwanda Libraries: The availability Library and Information Services for the Visually Impaired Students in University of Rwanda.

Information sources	Tick appropriately
Audio-Books produced by specialized libraries for the blind	
Assistive Technologies	
Internet and digital resources using Braille displays	
Talking Books	
Talking Newspapers	
Braille printer	
Braille book	

3. The extent of access and use of information materials at the University of Rwanda Library.

Information sources	**Tick appropriately**
Low	
Moderate	
High	

4. Rate the extent to which visually impaired students' access and use information materials at the University of Rwanda Libraries

STATEMENT	**Agree**	**Disagree**
The access of information by the visually-impaired students is at an extremely low level		
Books published worldwide every year are not made available in formats accessible to visually impaired persons		
Lack of access to information by visually-impaired people responsible for the persistence of negative stereotypes against visually-impaired people, particularly in terms of their intellectual capabilities		
It is difficult, if not almost impossible for visually-impaired students to access library information in a format that they can use		
Many visually-impaired students may not even have the capacity (such as Braille reading skills) to use information resources, even if they were available in the libraries.		

5. Rate the effectiveness of Rwanda Library regarding visually impaired students accessing information in the library

Effectiveness of Library regarding VIS accessing information	**Tick appropriately**
Effective	
Not Effective	

6 .Do you agree that University of Rwanda Libraries provide facilities and support system for visually impaired students that will enhance their access to information in the Libraries?

a. Strongly agree [ ]

b. Agree [ ]

c. Disagree [ ]

d. Strongly disagree [ ]

e. Undecided [ ]

7. The extent to which facilities and support system for the visually impaired students are available at the university library

Extent to which facilities and support sustem for VIS accessing are available	**Tick appropriately**
None	
Few	

8. Library materials available for the visually impaired students

Library materials available	**Tick appropriately**
JAWS	
Scanners	
Magnetic glasses	
Braille equipment	
Audio books	
Computer programs	
Screen magnification Monitors	
Screen readers	
Digital audio book	
Braille software	
Special rooms	
Large print	
Other, please specify	

9. Does the following most important information need met by the UR Libraries

Information needs of VIS	**meet up**	**Not meet up**
Media sources		
Newspapers		
Radio		
On-line resources including the internet		
Periodical database		

10. Please indicate whether you are agree or disagree by the challenges faced by the VIS in accessing and using information at the University of Rwanda libraries.

Challenges	**Agree**	**Disagree**
Lack of appropriate book formats for VIS		
Inadequate facilities such as well furnished Special rooms for VIS		
Inadequate funding to provide VIS equipment		
Inability of Library to provide Braille in form of tactile communication		
Access-friendly external environment		
Accessible services and facilities		
ICT technology in the library is inappropriate for VIS		
Students with visual impairment depend in readers to read		
Braille embossers, screen magnification and JAWS are not available		
Library staff negative attitudes		
Policy environment relating to library services provision for VIS		

11. Is there any strategies that can be used to improve access and use of visually impaired students at the University of Rwanda Libraries?

    a. Yes [ ]
    b. No [ ]

12. The type of strategies put in place to improve access and use of information for the visually impaired students

Strategies put in place	**Tick appropriately**
Layout of library building to aid VIS	
JAWS	
Improving buildings	
Purchase of more books Braille	
Training more staff	
Adapted texts of educational materials	
Tutors or personal assistant facilitate access to information	
Sign language interpreters	
Layout of library building to aid VIS	
Specialized materials for students	
VIS library	
Books in CDs	
Training more staff	
Budgetary support	
Layout of library building to aid VIS	
Books in Braille	
Special collection for VIS	
Other, please specify	

APPENDIX C: INTERVIEW SCHEDULE FOR VISUALLY IMPAIRED STUDENTS

I am a post graduate student at Moi University. It is a requirement of the course to carry out a research project. I am soliciting for information on the topic "access and use of information for visually impaired students at the University of Rwanda libraries". This research is purely academic and any information provided shall be treated with confidentiality. Kindly participate and respond appropriately to the questions given below. Your contributions are highly appreciated.

Date of interview: .....

SECTION A: PERSONAL DATA

1. Type of visual impairment: Totally blind [ ] Low vision [ ] Partially sighted [ ]
2. indicates which of the Campus

   Huye Campus [ ] College of Education [ ]

   College of Business and Economics [ ]

SECTION B: SPECIFIC RESEARCH QUESTIONS

1. What are the information sources available to visually impaired students in University of Rwanda Libraries? ----------

2. As a visually impaired students, do you often facing difficulties in accessing information in University of Rwanda Libraries?

   a. Yes [ ]

   b. No [ ]

3. How effective is University of Rwanda Libraries regarding visually impaired students accessing information in the Libraries?

Very effective [ ] Effective [ ] Fairly effective [ ]

Not effective [ ] Unpredictable [ ]

4. To what extent to which you access and use information materials at the University of Rwanda Libraries----------
---

5. Do you have the possibility of having a tutor or personal assistant to facilitate your access to information in the Libraries?

a. Yes [ ]

b. No [ ]

6. If yes, please elaborate----------
---

7. What are the Library materials available for you?

---

8. Do University of Rwanda Libraries have adapted texts of educational materials more suited for?

a. Yes [ ]

b. No [ ]

9. Do University of Rwanda Libraries have sign language interpreters or cued speech interpreters suited for you to access library?

a. Yes [ ]

b. No [ ]

10. If yes, please elaborate----------
---

11. Which library facilities available for you to access information in University of Rwanda Libraries.

12. Do you agree that University of Rwanda Libraries provide facilities and support for visually impaired students that will enhance their access to information in the Libraries?

a. Strongly agree [ ]

b. Agree [ ]

c. Disagree [ ]

d. Strongly disagree [ ]

e. Undecided [ ]

13. Are they any library staff who is trained to assist students with visual impairments?

a. Yes [ ]

b. No [ ]

14. Does the information needs for the visually impaired students are available in University of Rwanda Libraries?

a. Yes [ ]

b. No [ ]

15. If yes, please elaborate----------

---

16. Does the layout of library buildings allow student with visual impairments easy access to the information resources housed in the library?

a. Yes [ ]

b. No [ ]

17. If yes, please elaborate----------

---

18. Please indicate whether you are agree or disagree by the challenges faced by the VIS in accessing and using information at the University of Rwanda libraries.

Challenges	**Agree**	**Disagree**
Lack of appropriate book formats for VIS		
Inadequate facilities such as well furnished Special rooms for VIS		
Inadequate funding to provide VIS equipment		
Inability of Library to provide Braille in form of tactile communication		
Access-friendly external environment		
Accessible services and facilities		
ICT technology in the library is inappropriate for VIS		
Students with visual impairment depend in readers to read		
Braille embossers, screen magnification and JAWS are not available		
Library staff negative attitudes		
Policy environment relating to library services provision for VIS		

19. Is there any strategies that can be used to improve access and use of information for visually impaired students at the University of Rwanda Libraries?

a. Yes [ ]
b. No [ ]

19. List the strategies that can be used to improve access and use of information for visually impaired students at the University of Rwanda Libraries

1.
2.

APPENDIX D: INTERVIEW SCHEDULE FOR CAMPUS DEAN OF STUDENTS

I am a post graduate student at Moi University. It is a requirement of the course to carry out a research project. I am soliciting for information on the topic "access and use of information for visually impaired students at the University of Rwanda libraries". This research is purely academic and any information provided shall be treated with confidentiality. Kindly participate and respond appropriately to the questions given below. Your contributions are highly appreciated.

Date of interview: .....

SECTION A: PERSONAL DATA

1. Indicates which of the University of Rwanda colleges you work as dean of students:

Huye Campus [ ] College of Education [ ]

College of Business and Economics [ ]

2. Does the information resources available in the library are suitable for students with visual impairments?

a. Yes [ ]

b. No [ ]

If yes, please elaborate----------

3. Does the library facilities assist students with visual impairments on information provision in academic libraries in University of Rwanda colleges?

a. Yes [ ]

b. No [ ]

If yes, please elaborate----------

4. Do you agree that University of Rwanda Libraries provide facilities and support system for visually impaired students that will enhance their access to information in the Libraries?

a. Strongly agree [ ]

b. Agree [ ]

c. Disagree [ ]

d. Strongly disagree [ ]

e. Undecided [ ]

5**.** The extent of access and use of information materials at the University of Rwanda Library. Please tick appropriately

Item	**Issues**	**High**	**Moderate**	**Low**
1	Level of Access information			
2	Access to information is low			
3	Lack of access to information by VIS			
4	Difficult for VIS to access information			
5	Ignorance of the VIS to use information resources			

6. Please indicate whether you are agree or disagree by the challenges faced by the VIS in accessing and using information at the University of Rwanda libraries.

Challenges	**Agree**	**Disagree**
Lack of appropriate book formats for VIS		
Inadequate facilities such as well furnished Special rooms for VIS		
Inadequate funding to provide VIS equipment		
Inability of Library to provide Braille in form of tactile communication		
Access-friendly external environment		
Accessible services and facilities		
ICT technology in the library is inappropriate for VIS		
Students with visual impairment depend in readers to read		
Braille embossers, screen magnification and JAWS are not available		
Library staff negative attitudes		
Policy environment relating to library services provision for VIS		

7. Is there any strategies that can be used to improve access and use of visually impaired students at the University of Rwanda Libraries?

a. Yes [ ]
b. No [ ]

8. List the strategies that can be used to improve access and use of visually impaired students at the University of Rwanda Libraries

1.
2.

APPENDIX E: INTERVIEW SCHEDULE FOR LECTURERS

I am a post graduate student at Moi University. It is a requirement of the course to carry out a research project. I am soliciting for information on the topic "access and use of information for visually impaired students at the University of Rwanda libraries". This research is purely academic and any information provided shall be treated with confidentiality. Kindly participate and respond appropriately to the questions given below. Your contributions are highly appreciated.

Date of interview: .....

SECTION A: PERSONAL DATA

1. Indicates which of the University of Rwanda colleges you work as lecturer:

Huye Campus [ ] College of Education [ ]

College of Business and Economics [ ]

2. Please indicate whether you strongly agree (SA), agree (A), are undecided (U), disagree (D), or strongly disagree (SD) with the following statements on whether the layout of the library buildings allow students with visual impairments to access information resources domicile in the library without difficulty.

Item	Issues	SA	A	U	D	SD
1	Library buildings layout in the UR does not allow VIS easy access to the information resources in the library					
2	The three campuses of UR had no functioning lifts and ramps which enable VIS to access information resources in the library					
3	Library buildings in UR are unsuitable for the mobility needs of VIS					
4	Library buildings in UR have no rail-marks for easy identification and protected embankments					
5	The design of the UR library buildings does not provide easy access for VIS					

3. Does the information resources available in the library are suitable for students with visual impairments?

a. Yes [ ]

b. No [ ]

If yes, please elaborate----------

4. Does the ICT facilities assist students with visual impairments on information provision in academic libraries in University of Rwanda colleges?

a. Yes [ ]

b. No [ ]

If yes, please elaborate----------

5. Do you agree that University of Rwanda Libraries provide facilities and support system for visually impaired students that will enhance their access to information in the Libraries?

a. Strongly agree [ ]

b. Agree [ ]

c. Disagree [ ]

d. Strongly disagree [ ]

e. Undecided [ ]

6**.** The extent of access and use of information materials at the University of Rwanda Library. Please tick appropriately

Item	**Issues**	**High**	**Moderate**	**Low**
1	Level of Access to information			
2	Access to information is low			
3	Books for VIS is not made available in the library			
4	Lack of access to information by VIS			
5	Difficult for VIS to access information			
6	Ignorance of the VIS to use information resources			

7. Please indicate whether you are agree or disagree by the challenges faced by the VIS in accessing and using information at the University of Rwanda libraries.

Challenges	**Agree**	**Disagree**
Lack of appropriate book formats for VIS		
Inadequate facilities such as well furnished Special rooms for VIS		
Inadequate funding to provide VIS equipment		
Inability of Library to provide Braille in form of tactile communication		
Access-friendly external environment		
Accessible services and facilities		
ICT technology in the library is inappropriate for VIS		
Students with visual impairment depend in readers to read		
Braille embossers, screen magnification and JAWS are not available		
Library staff negative attitudes		
Policy environment relating to library services provision for VIS		

8. Is there any strategies that can be used to improve access and use of visually impaired students at the University of Rwanda Libraries?

a. Yes [ ]
b. No [ ]

9. List the strategies that can be used to improve access and use of visually impaired students at the University of Rwanda Libraries

1.
2.

APPENDIX F: INTRODUCTORY LETTER FROM MOI UNIVERISTY

MOI UNIVERSITY
DEPARTMENT OF LIBRARY, RECORDS MANAGEMENT AND INFORMATION STUDIES
Tel: (053) 43231
Fax No. (053) 43292
Telex NO: 35047 MOIVASITY
E-Mail: hodlis@mu.ac.ke OR deanis@mu.ac.ke
P. O. Box 3900
Eldoret
Kenya.

REF: IS/MSC/LIS/29/13

10h December, 2014

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: DATA COLLECTION – UMUTESI ANNONCIATTE (IS/MSC/LIS/29/13)

The above named is a postgraduate student in the Department of Library, Records Management and Information Studies, School of Information Sciences, Moi University pursuing a Master of Science Degree in Library and Information Sciences She is carrying out a research programme entitled ***"Access and Use of Information for Visually Impaired Students at the University of Rwanda Libraries"*** under the supervision of Mr. Duncan Amoth and Dr. Damaris Odero.

The purpose of writing is to request you to kindly allow Ms. Umutesi to conduct the research in your organization beginning January, 2015 and request your staff to assist her collect the necessary data. The information given will be treated with utmost confidentiality and will be used only for the purpose of the research. We look forward to your continued support and co-operation.

Yours sincerely,

HEAD, DEPARTMENT OF LIBRARY, RECORDS MOI UNIVERSITY DATE 15/12/2014 MANAGEMENT AND INFORMATION STUDIES

DR. DAMARIS ODERO
SENIOR LECTURER AND HEAD,
DEPARTMENT OF LIBRARY, RECORDS MANAGEMENT & INFORMATION STUDIES.

DO/mn

APPENDIX G: INTRODUCTORY LETTER TO CARRY OUT RESEARCH AT CBE GIKONDO CAMPUS

UNIVERSITY OF RWANDA

Research and Postgraduate Studies Unit

Kigali, 18th December 2014
URDRPGS/00202/012/2014

To the Principal
College of Business and Economics
University of Rwanda

Dear Dr. Musafiri,

Re: Introduction to carry out research
The above captioned matter refers

On behalf of the University of Rwanda, I am pleased to introduce to you, Ms. Annonciata Umutesi, a staff of University of Rwanda Library who is undertaking Postgraduate Studies at Moi University. She will be collecting data in your institution on her Master Degree in Library and Information Sciences research project titled ***"Access and Use of Information for Visual Impaired Students at the University of Rwanda Libraries"*** for the period 5th January to15th February 2015.

Kindly accord her your cooperation to enable her research to be successful.

In case you need more information, please do not hesitate to contact the University of Rwanda Director of Research and Postgraduate Studies Unit on V.G.Masanja@ur.ac.rw

With kind regards,

UNIVERSITY OF RWANDA
Prof. Verdiana Grace Masanja
Coordinator of UR Research Activities

Prof. Verdiana Grace Masanja
University Director, Research and Post Graduate Studies Unit

CC:
- Vice Chancellor
- Deputy Vice Chancellor (All)

APPENDIX H: INTRODUCTORY TO CARRY OUT RESEARCH AT CE REMERA CAMPUS

UNIVERSITY OF RWANDA

Research and Postgraduate Studies Unit

Kigali, 18th December 2014
URDRPGS/00201/012/2014

To the Principal
College of Education
University of Rwanda

Dear Prof. Njoroge,

Re: Introduction to carry out research
The above captioned matter refers

On behalf of the University of Rwanda, I am pleased to introduce to you, Ms. Annonciata Umutesi, a staff of University of Rwanda Library who is undertaking Postgraduate Studies at Moi University. She will be collecting data in your institution on her Master Degree in Library and Information Sciences research project titled ***"Access and Use of Information for Visual Impaired Students at the University of Rwanda Libraries"*** for the period 5th January to15th February 2015.

Kindly accord her your cooperation to enable her research to be successful.

In case you need more information, please do not hesitate to contact the University of Rwanda Director of Research and Postgraduate Studies Unit on V.G.Masanja@ur.ac.rw

With kind regards,

UNIVERSITY OF RWANDA
Prof. Verdiana Grace Masanja
Coordinator of UR Research Activities

Prof. Verdiana Grace Masanja
University Director, Research and Post Graduate Studies Unit

CC:
- Vice Chancellor
- Deputy Vice Chancellor (All)

APPENDIX I: INTRODUCTORY LETTER TO CARRY OUT RESEARCH AT HUYE CAMPUS

UNIVERSITY OF RWANDA

Research and Postgraduate Studies Unit

Kigali, 18th December 2014
URDRPGS/00203/012/2014

To the Principal
College of Arts and Social Sciences
University of Rwanda

Dear Dr. Kaitesi,

Re: Introduction to carry out research
The above captioned matter refers

On behalf of the University of Rwanda, I am pleased to introduce to you, Ms. Annonciata Umutesi, a staff of University of Rwanda Library who is undertaking Postgraduate Studies at Moi University. She will be collecting data in your institution on her Master Degree in Library and Information Sciences research project titled ***"Access and Use of Information for Visual Impaired Students at the University of Rwanda Libraries"*** for the period 5th January to15th February 2015.

Kindly accord her your cooperation to enable her research to be successful.

In case you need more information, please do not hesitate to contact the University of Rwanda Director of Research and Postgraduate Studies Unit on V.G.Masanja@ur.ac.rw

With kind regards,

UNIVERSITY OF RWANDA
Prof. Verdiana Grace Masanja
Coordinator of UR Research

Prof. Verdiana Grace Masanja
University Director, Research and Post Graduate Studies Unit

CC:
- Vice Chancellor
- Deputy Vice Chancellor (All)