Barriers affecting access to higher education at a university of technology by students with hearing impairments.

BARRIERS AFFECTING ACCESS TO HIGHER EDUCATION AT A UNIVERSITY OF TECHNOLOGY BY STUDENTS WITH HEARING IMPAIRMENTS

by

MMOTLANA JOSEPH MOKONYANE

Submitted in partial fulfilment of the requirements for the degree

MASTER'S DEGREE IN BUSINESS ADMINISTRATION (MBA)

in the

Business School

FACULTY OF MANAGEMENT SCIENCES

TSHWANE UNIVERSITY OF TECHNOLOGY

Supervisor: Dr A Wissing

September 2019

DECLARATION

This is to confirm that the research conducted is my original work and has not been submitted for examination for an awarded degree before.

Signature_____ Date_____

Mmotlana Joseph Mokonyane

Student number: 98157255

This research study has been submitted for examination with my approval as the University supervisor.

Signature_____ Date_____

Dr Annelise Wissing

Curriculum Development Practitioner

Tshwane University of Technology

DEDICATION

To my lovely wife Mabotse Celeste Mokonyane and our two sons, Kabelo and Katlego, for their support and for believing in me. To my parents, Mrs Sophy and Timothy Mokonyane, for bringing me to this earth and ensuring that I get an education. Lastly, not to forget the Creator of the universe, God, who made everything possible for me.

ACKNOWLEDGEMENTS

I wish to sincerely thank my supervisor, Dr Annelise Wissing, for her guidance and constructive criticism throughout my research study. Mr Vincent Maduna for his assistance with statistical data analysis. Mr Benny Phaladi for his mentorship, support and advice during my academic studies. My sincere gratitude goes to my fellow classmates for not being selfish in sharing information during our studies, my study participants who are also my colleagues for their cooperation, and my colleagues in the Faculty of Science, especially my line manager, for constant support and encouragement.

TABLE OF CONTENTS

DECLARATION……...…..i

DEDICATION…….…...ii

ACKNOWLEDGEMENTS…….…..iii

LIST OF TABLES…….iv

LIST OF FIGURES……v

LIST OF APPENDICES……vi

LIST OF ABBREVIATIONS AND ACRONYMS……..…vii

ABSTRACT…….....viii

CHAPTER ONE: INTRODUCTION AND BACKGROUND TO THE STUDY……1

1.1 Introduction……1

1.2 Background……3

1.3 Definitions……..5

1.4 The rationale of the study……...7

1.5 Problem statement……..7

1.6 Aims of the study……9

1.7 Research questions…….9

1.8 Objectives of the study…….10

1.9 Significance of the study……..10

1.10 Scope of the study……...11

1.11 Structure of the study…….11

1.12 Summary……11

CHAPTER TWO: LITERATURE REVIEW……...12

2.1 Introduction……..12

2.2 Barriers to learning and participation……13

2.3 Inclusive education and participation……...16

2.4 Policy framework……18

2.5 Theoretical framework……23

2.5.1 Language of instruction……23

2.5.2 Recruitment of students with hearing impairments……24

2.5.3 Enrolment of students with hearing impairments……..24

2.5.4 Learning spaces……25

2.5.5 Support structure……...26

2.5.6 University policy on persons with disabilities.……35

2.5.7 Summary..……36

CHAPTER THREE: RESEARCH METHODOLOGY……...38

3.1 Introduction……..38

3.2 Research area……...38

3.3 Research objectives……38

3.4 Research design……40

3.5 Population and sampling……..43

3.6 Data collection……46

3.7 Data analysis……49

3.8 Ethical considerations……...50

3.9 Cost and funding……...52

3.10 Summary……52

CHAPTER FOUR: DATA COLLECTION, ANALYSIS AND FINDINGS…….53

4.1 Introduction……..53

4.2 Response rate and participants' profile……53

4.3 Personal data……54

4.4 Data presentation…….57

4.5 Summary……..76

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS……...77

5.1 Introduction……..77

5.2 Summary from the findings of the study…….77

5.3 Conclusions of the study …….78

5.4 Recommendations……80

5.5 List of references……..……84

LIST OF TABLES

Table 1.1 2016-2018 statistics on students with disabilities……...8

Table 3.1 Advantages and disadvantages of a quantitative study.……41

Table 3.2 Stratified sampling…….45

LIST OF FIGURES

Figure 2.1 Theoretical framework……...29

Figure 2.2 Operational processes……32

Figure 3.1 The road map of the research methodology for the current study…….39

Figure 3.2 Unit of analysis on dependent and independent variables…….42

Figure 4.1 University divisions under study……...55

Figure 4.2 Category of employment……56

Figure 4.3 Responses on staff interaction with students ……57

Figure 4.4 Awareness of SASL recognition…….……...58

Figure 4.5 Staff who can communicate in SASL……58

Figure 4.6 SL can improve communication……59

Figure 4.7 Policy on persons with disabilities…….60

Figure 4.8 Staff experience with individuals with hearing impairments……60

Figure 4.9 Awareness campaigns on persons with disabilities……...62

Figure 4.10 Implementation of policy on persons with disabilities……...……...63

Figure 4.11 Barriers to implementation of policy…….63

Figure 4.12 Inclusiveness of the institution……..64

Figure 4.13 Institution's readiness to accommodate students with hearing impairments…....65

Figure 4.14 Support structures/resources to cater for students with hearing impairments.....65

LIST OF APPENDICES

Appendix 1: Letter of permission to conduct study

Appendix 2: Ethical clearance letter from TUT

Appendix 3: Informed consent form

Appendix 4: Survey questionnaire

LIST OF ABBREVIATIONS AND ACRONYMS

AT	Assistive Technologies
BHI	Better Hearing Institute
DHET	Department of Higher Education and Training
DSA	Disabled Students' Allowance
DSOs	Disabled People's Organisations
GDP	Global Diversity Practice
DU	Disability Unit
HEMIS	Higher Education Management Information System
HE	Higher Education
HI	Hearing Impaired
IDE	International Disabled Student Fund
LOLT	Language of Learning and Teaching
PanSALB	Pan South African Language Board
SASL	South African Sign Language
SDS	Student Development and Support
SETA	Sector Education and Training Authority
SL	Sign Language
STATS	Statistics South Africa
TUT	Tshwane University of Technology

TVET	Technical and Vocational Education and Training
UoT	University of Technology
UNESCO	United Nations Educational Scientific and Cultural Organisation
WPRPD	White Paper on the Rights of Persons with Disabilities

ABSTRACT

Tertiary education in South Africa is not designed in a manner that is suitable for persons with disabilities. Students with hearing impairments are expected to sit in the same lecture rooms with their counter parts who are abled-bodied. The learning and teaching methods designed for able-bodied students include, for example, lecture rooms, examination venues, libraries, and the medium of instruction. Students with hearing impairments struggle in getting accommodation at the university due to lack of communication and information on courses.

The research employed a quantitative research methodology. The quantitative study anchored a positivist approach, where a quantitative approach was used to conduct the study. In this study, the researcher used questionnaire research designed to investigate the barriers affecting access to higher education by students with hearing impairments. There is one admission/registration processes for all students and no special processes for students with hearing impairments. Most university staff who are supposed to assist students have never heard of or cannot communicate in sign language.

Awareness campaigns regarding persons with disabilities will improve services for students with hearing impairments at a university of technology. The university will benefit from the study as it provides a greater and depth understanding of the needs and challenges of students with hearing impairments.

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1. INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This study evolved from my personal experience as an employee of a university of technology (UoT). My interest in the disabled population started a decade ago when I initiated a project called Computers for the Blind. Following the project's approval by the university, I raised funds to sustain the project. A senior staff member responsible for the approval for funding in one of the institutions was disabled. He challenged me to consider doing research for students with hearing impairments, and raised his concern about universities' failure to conduct research in order to investigate ways to assist hearing-impaired learners to access tertiary education.

According to Bell, Carl and Swart (2016:1), "Since 1994, the South African government has been committed to the transformation of the entire education system with changes in global initiatives regarding inclusive education, also influencing the drive towards inclusion locally. Therefore, higher education institutions (HEIs) have been encouraged to promote both equal access and participation to all students, irrespective of race, gender, language, age or disability".

According to the Constitution of the Republic of South Africa (1996), "The state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth. Everyone has inherent dignity and the right to have their dignity respected and protected. Everyone has the right to receive education in

the official language or languages of their choice in public educational institutions where that education is reasonably practicable".

South Africa, as a young democracy, still faces challenges regarding, for instance, human rights, inequality, and unfair discrimination. Many persons with disabilities still find themselves disadvantaged in different ways. These might be in terms of resources, education or employment. The South African education system consists of three phases; primary, secondary and tertiary, and of the three phases, only children who fall under basic education are given any attention when it comes to dealing with disabilities. Moloi and Motaung (2014:371) emphasise how government has established special schools at basic education level, which accommodate the needs of learners with hearing impairments, including accommodating deaf learners, while the same opportunities are limited at institutions of higher learning. At tertiary level, these learners are expected to integrate with their able-bodied peers.

Persons with disabilities are not finding it easy to access institutions of higher learning simply because when the system was designed, their specific circumstances and needs were not taken into consideration. The Constitution of the Republic South Africa (1996) recognised South African Sign Language (SASL), but access for students on the hearing impairment spectrum to public universities in the country nonetheless remains limited. There are different categories of students with hearing impairments: deaf students who cannot hear at all and who therefore communicate using sign language, and students with hearing impairments who can hear partially, but require the use of hearing aids. In this study, the term "hearing-impaired" students will refer to all students on the hearing-impaired continuum.

1.2 BACKGROUND

The purpose of this study is to investigate current barriers to access to institutions of higher learning by students with hearing impairments, in order to develop a framework of access for potential students with this special need. This investigation will thus be based on a university's operational functions and processes such as admission, registration, student services, and academic learning and teaching. The barriers of admission to institutions of higher learning that exist for hearing-impaired students is not only a South African problem. Many countries in the world are faced with similar problems.

Bell et al. (2016:1), claim that a focus on the South African population discloses important statistics. According to Statistics South Africa, using the Washington Group Model, the 2011 National Census estimated that there was an impairment prevalence of 7.5% (Statistics South Africa, 2011). The results from the same census related to hearing impairment shows that 0.1% of the population cannot hear at all; 0.5% experience a lot of difficulty, 2.9% experience some difficulty and the rest, 96.4%, have no difficulty hearing (Statistics South Africa, 2011).

Magongwa (2010:495) emphasises that in order for students with hearing impairments to be able to succeed in their learning journeys, institutions of higher learning should provide adequate support services for them. The processes within the education system often seem to be designed in an unfair manner as it seems to exclude students with hearing impairments. The learning needs of students with hearing impairments should be integrated into the system. Communication with other students, support staff and academic staff is one example. Hearing-impaired students will need to communicate with all applicable staff members regarding all organisational aspects of their course, but might encounter difficulties in doing so because of their hearing impairment.

Woodcock, Rohan and Campbell (2007:364) emphasise that hearing impairment changes the way a student collects information and directs the expectations of the curriculum. It limits a student's chances to learn through auditory perceptual pathways, which remains a primary strategy in current learning environments. In addition to regular classroom experiences, students who are hearing impaired need to learn specialised skills from those who support their learning journey. The lack of qualified interpreters, combined with the lack of orientation and mobility practitioners for hearing impaired students, might restrict access and the functioning of these students. Engelbrecht (2006:256) states that, "Inclusive education within the South African context is therefore framed within a human rights approach, transforming the human values of integration into the immediate rights of excluded learners".

The implementation of an inclusive education approach will assist hearing impaired students to be fully integrated into the current education system. The purpose of this study is therefore to investigate the internal processes regarding the overall readiness of a university to accommodate hearing-impaired applicants.

Mayat and Amosun (2011:53) argue that people believe academic staff are reluctant to learn about some challenges that students with hearing impairments experience in their academic journey and that impact on students' chance of being accommodated in programmes. Institutions of higher learning have the responsibility to ensure that education is for all, irrespective of, inter alia, students' background, race, gender, or religion. These institutions are sometimes faced with the responsibility to ensure that university staff's mindsets are prepared for change and to extend their knowledge in order to cater for the academic interests of students with disabilities – for the purposes of this study, hearing impairments. Students with hearing impairments need assistance in order to communicate effectively with their peers or to learn in various learning spaces. They

can either make use of an interpreter or of the technological assistive devices, if any, made available. To narrow the study, this research will only be focusing on a single university of technology.

1.3 DEFINITIONS

1.3.1 Disability

Leonardi, Bickenbach, Ustun, Kostanjsek and Chatterji (2006:1220) define disability as a "state of decreased functioning associated with disease, disorder, injury, or other health conditions, which in the context of one's environment is experienced as an impairment, activity limitation, or participation restriction". In order to bring any form of intervention that will assist in improving the involvement of people with disability, the health and environmental traits of disability should be understood so that the environment could be adapted accordingly. The disability often lies more in the environment that does not cater for the special needs.

1.3.2 Impairment

According to the White Paper on the Rights of Persons with Disabilities (South Africa, 2015b:8), "Impairment is a perceived or actual feature in the person's body or functioning that may result in limitation or loss of activity or restricted participation of the person in society with a consequential difference of physiological and/or psychological experience of life".

1.3.3 Deafness

Varshney (2016:73) states that, "deafness means loss of hearing and it may be partial or total. Hearing impairment cannot be seen and hence its effects are not visible to others, so the deaf suffers in silence".

1.3.4 Universal access

Universal access, according to the White Paper on the Rights of Persons with Disabilities (South Africa, 2015b:15), refers to the removal of any form of obstacles that stop people with disabilities from partaking, or stop them from benefiting from various cultural, physical, and social activities in the society that are made available to residents and other citizens.

1.3.5 Inclusion

According to the White Paper on the Rights of Persons with Disabilities (South Africa, 2015b:8), inclusion is a collective human right which aims at ensuring that all people are accepting of each other regardless of any differences. It is about giving access to all, opening prospects, and eradicating discrimination.

1.3.6 Diversity

Nel, van Dyk, Haasbroek, Schultz, Sono and Werner (2004:178) note that diversity is all about acknowledging that people are different, behave differently and come from different backgrounds. According to Global Diversity Practice (2017), diversity is "any dimension that can be used to differentiate groups and people from one another. In a nutshell, it's about empowering people by respecting and appreciating what makes them different, in terms of age, gender, ethnicity, religion, disability, sexual orientation, education, and national origin".

1.3.7 Sign language

Rajam and Balakrishnan (2011:737) define sign language as the means of communication for students with hearing impairments. Sign language uses body language were the speaker expresses communication and each gesture communicates the message.

1.3.8 Sign language interpreter

This is a qualified person who is able to translate the spoken language into sign language for hearing-impaired individuals.

1.3.9 Hearing aid

An assistive device designed to assist hearing impaired people in improving sound during speech.

1.3.10 Hearing impairment

Hearing impairment encompasses various hearing losses from minor to a complete loss.

1.4 THE RATIONALE OF THE STUDY

There are 26 public universities in South Africa, but only two have units dedicated to students with hearing impairments. Such a unit is sometimes called a Deaf unit. The rest incorporate students with hearing impairments in their disability units that accommodate all forms of disability. Having a unit designed to cater for specific groups of persons with disabilities indicates how important they consider the support for students with that special need.

Bell et al. (2016.1) point out that South African higher education institutions are now have a growing number of students with hearing loss since the institutions opened doors for the students by adopting a policy on inclusive education.

1.5 PROBLEM STATEMENT

The university of technology under study enrols approximately 50 000 students yearly, but the number of persons with disabilities remains very low, especially when considering students with hearing impairments. Regardless of the institution's policy on persons with disabilities, the enrolment of students with hearing impairments is consistently very low. Bell et al. (2016.2), state

that numbers received from Higher Education Management System (HEMIS) records show a significant increase in the number of students with hearing impairments who were enrolled between 2003 and 2010 at South African institutions of higher education. Whereas only 155 such students were enrolled in 2003 there were 326 in 2010. Many hearing-impaired learners' academic learning opportunities end when they complete Grade Twelve, as they do not progress to tertiary education.

According to DHET (South Africa, 2015a), all of the 26 public universities in South Africa should accommodate hearing-impaired learners. The majority of these universities have developed legislative frameworks and policies in line with the constitution of the country, but there are challenges with implementation. Moloi and Motaung (2014:371) maintain that if South African learners with hearing impairments are taught using the medium of sign language, barriers to learning would be minimised.

The university under study enrolled 59 908 students in 2016, 64 352 in 2017, and 65 877 in 2018, yet the representation of students with disabilities within these enrolments remains very low.

The table below shows the number of students with disabilities for the period 2016 to 2018, as provided by the university's disability unit (DU).

Table 1.1: 2016-2018 Statistics of students with disabilities at UoT

Type of disability	**2016**	**2017**	**2018**	**TOTAL**
Blindness	1	14	14	**29**
Poor vision	29	58	50	**137**
Hearing impaired	1	2	1	**4**

Learning disabilities	26	19	13	**58**
Physical disabilities	28	41	28	**97**
TOTAL	**85**	**134**	**106**	**325**

The figures in the table above clearly indicate that more effort is required to ensure that all barriers are removed from the system. Admission policies also need to be reviewed to ensure that they address all identified challenges.

1.6 AIMS OF THE STUDY

The aim of the study is to establish whether the university concerned makes provision for access to students with hearing impairments by adopting and implementing policies in line with government legislation, and especially policies regarding persons with disabilities. The study will also look at university support services in terms of human resources during the registration process, tests, examinations, and classrooms resources that will assist during learning and teaching experiences.

1.7 RESEARCH QUESTIONS

1.7.1 Primary research question

The primary research question the researcher wishes to answer is:

What processes and infrastructure are available for learning impaired students at a university of technology?

1.7.2 Secondary research questions

The following secondary questions will be investigated:

- What are the needs of hearing-impaired students at a UoT?

- Does the university have suitable support resources in place to fulfil the needs of students with hearing impairments?
- What measures can be put in place to make sure that students with hearing impairments are supported during their studies?
- What possible guidelines could assist the university in addressing these challenges?

1.8 OBJECTIVES OF THE STUDY

The purpose of the study is to determine the barriers to implementation of policies to access into institutions of higher learning by students with hearing impairments, so as to inform frameworks that will increase access for potential students with this special need.

- To assess the university's readiness to enrol students with hearing impairments, and;
- To establish whether there is adequate support for students with hearing impairments to experience a successful academic career.

1.9 SIGNIFICANCE OF THE STUDY

This study is crucial not only to persons with disabilities, but also to institutions of higher learning and the DHET, to ensure that all barriers to access are removed from the system. The research results will contribute to the body of knowledge in the education sector and help in improving the lives and academic prospects of students with hearing impairments. The study could assist institutions of higher learning in terms of informing them how they could support the needs of students with hearing impairments in the best possible way. The study will raise awareness of the challenges faced by all hearing-impaired students, so that institutions of higher education in general will be better prepared to support these students.

1.10 SCOPE OF THE STUDY

This research study's focus is on a multi-campus university of technology with campuses located in the Gauteng, North West, Mpumalanga, and Limpopo provinces of South Africa. It will use data collected from university staff, and no historical data will be used in the analysis. The scope is limited to a single university of technology, and the investigation will look at processes such as admission, registration, examination, and teaching and learning experiences in learning spaces.

1.11 STURCTURE OF THE STUDY

Chapter 1: Introduction

Chapter 2: Literature review

Chapter 3: Methods and materials of study

Chapter 4: Data analysis and research findings

Chapter 5: Summary, conclusion and recommendations

1.12 SUMMARY

This chapter covered the introduction and background to the study, rationale of the study, problem statement, significance of the study, the aim and objectives of the study, and important definitions applied in the study. In Chapter Two, some literature and studies conducted on factors affecting access to higher education by students with hearing impairments will be reviewed.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews previous studies conducted on the barriers affecting access to higher education of students with hearing impairments, and looks at research outcomes. The chapter starts by looking at the challenges faced by students, the support available to students, and government's policy framework regarding access for students with hearing impairments. This chapter further discusses the relevance of the theory to the current study. According to Manalo and Trafford (2004:1), a literature review is one of the most important parts of research. It incorporates a combination of information from various researchers who previously conducted studies to find gaps and to look at opportunities for future research to address those gaps.

According to the Constitution of the Republic of South Africa (1996), education is a human right. All people, including those with hearing impairments, have human rights. These human rights encompass admission to higher education. South Africa has seen significant changes in the past twenty years of democratic governance in the way in which disabilities are addressed. The government has advanced in ensuring that there is implementation of policies and a transformation agenda which aims at building a fair and equitable society for all. The purpose of the agenda is to ensure that all who were previously disadvantaged and all who are regarded as vulnerable groups of people are included, including persons with disabilities.

According to UNESCO (2015:31), education systems ought to open doors to all people especially persons with disabilities who could not previously gain access to education. Government has a

duty to make sure that education systems are inclusive for all people, including persons with disabilities, by passing legislation that will assist in removing barriers and hold institutions accountable. Monitoring systems should be put in place that support processes and procedures to ensure that quality is not compromised. Funding for institutions of higher learning is one of the barriers that prevent institutions to implement inclusive access due the cost involved. Access to data would assist institutions in ensuring that mechanisms are put in place to remove all barriers to education.

2.2 BARRIERS TO LEARNING AND PARTICIPATIOIN

There is an absence of research in South Africa regarding those barriers that prevent students with hearing impairments from accessing institutions of higher learning. Researchers need to explore further to determine the cause of this lack of access to South African tertiary institutions by students with hearing impairments. Hanafin, Shevlin, Kenny and Neela (2007:436) emphasise that there is lack of initiative in the education sector to speak about, or to attempt to eradicate challenges that many students with hearing impairments are confronted with at institutions of higher learning. University researchers should assist in exploring improved ways of advancing the rights of persons with disabilities, including hearing-impaired students, who wish to further their studies. A milestone would be reached if institutions of higher education could introduce policies that address the needs of students with hearing impairments and thereby open their doors for such students. These barriers could also be reduced if university staff could commit themselves to learning sign language.

Gudyanga, Wadesango and Eliphanos (2014:445-448) emphasise that students with hearing impairments encounter various challenges in their everyday lives, such as difficulty in

communicating with their peers, frustration and isolation, and teachers' attitudes about the inclusion of those students. The communication gap between them and their peers makes it difficult to share information and even to learn from one another. Although the communication gap can be bridged by using interpreters and assistive devices such as hearing aids, many hearing-impaired students still experience challenges because of a lack of resources. Bell et al. (2016:3) state that there are barriers in the education sector that affect persons with disabilities. Some of the barriers represent resources such as physical structures, accessible residences, and financial resources. It also refers to the unwillingness of academic staff to make an effort to learn about persons with disabilities and the complexity of these individuals' academic needs. Mayat and Amosun (2011:53) claim that the study they conducted suggests that lecturers are seen as barriers because of their unwillingness to take the lead in the support for students with disabilities. The lack of awareness campaigns regarding disability also has an influence on decisions taken about matters relating to persons with disabilities.

Moloi and Motaung (2014:370) discovered during their research that there is not sufficient research conducted on access and support for students with hearing impairments at tertiary institutions in South Africa that focuses on the improvement of quality education for deaf students. Students with hearing impairments who are enrolled at institutions of higher learning need to be provided with sign language interpreters during their academic journey, however thus far, few institutions have such interpreters available. Magongwa (2010:493) indicates that deaf learners are affected by various factors during their learning career. These factors are, among others, not having peers who have succeeded academically who they can look up to, not being able to communicate with their peers who are able-bodied without having someone interpreting for them, and having hardly any academic staff who can communicate confidently in sign language. Schick, Williams

and Kupermintz (2006:3) state that there are few qualified language interpreters and that fact has a negative impact on students with hearing impairments gaining access into institutions of higher learning.

Universal access for persons with disabilities in education is now gaining momentum globally. Bines and Lei (2011:422) indicate that many countries still do not have a plan of action on how to support inclusive education. This is the result of not enough information available on processes as there is no study conducted. Persons with disabilities who wish to enrol in primary education have limited access to it, especially in developing countries, due to a lack of resources. The right to all levels of education by students with disabilities is now gaining support from the education sector through policy development and implementation. Bines and Lei (2011:419) argue that the right to education for persons with disabilities has not been given enough attention in most countries. In order to advance inclusive education, institutions need to start by reviewing policies, building capacity, sourcing funds and information about the needs for persons with disabilities, and promoting awareness. According to Komesaroff (2005:390), the fact that sign language is not being used in many institutions of higher learning inspired her to cultivate interest in the inclusion of students with hearing impairments. She continues to stress the importance of hearing-impaired students having visits in their learning spaces from deaf colleagues who have succeeded in their careers to show support and encourage them. Once inclusive policies are adopted and implemented, students with hearing impairments will find institutions more accessible. These students should then be able to participate academically.

2.3 INCLUSIVE EDUCATION AND PARTICIPATION

According to UNESCO (2005:21), inclusive education is a process whereby the needs of all students irrespective of their family background, disability, age, gender, or race are accommodated in the academic institutions in terms of operational processes, procedures, and curriculum. Transformation of the education sector is the only way of making sure that every learner is given an opportunity to access quality education. Inclusion is not only about policies but it is also about equal rights that all students have while pursuing academic journeys at institutions. Inclusive education means that the education sector should put the needs of persons with disabilities at the centre of their academic planning in terms of curriculum and infrastructure. Opening opportunities for students with hearing impairments is not only about giving them access but by making sure that support structures are in place too.

WPRPD South Africa (2015b) describes inclusion as follows: "It is about a sense of belonging: feeling respected, valued for who you are; feeling a level of supportive energy and commitment from others so that you can fully participate in society with no restrictions or limitations. Inclusion implies a change from an individual change model to a system change model that emphasises that society must change to accommodate diversity".

Komesaroff (2005:389) indicates that during her research she found that students with hearing impairments were treated in the same way in their academic journey as their peers who are able-bodied. Hearing impaired students were given the same study material and had to attend lectures that were designed for hearing students. The author also states that many institutions of higher learning were designed to cater for the interests of hearing students only as they are presented in larger numbers than students with special needs. Her study (Komesaroff, 2005:389), conducted

in Australia, found that English is the only language used in the classrooms and institutions need to start developing courses to be offered in both English and sign language in order to accommodate students using sign language. The research also found that there is a lack of interest from government in enforcing the implementation of language policies that will assist students with hearing impairments to access higher education.

Fuller, Bradley and Healey (2004:455) state that the career prospects for persons with disabilities are limited as many are not able to access institutions of higher learning in order to empower themselves academically. Even though institutions of higher learning are increasing access and participation, students with hearing impairments are not given opportunities to express their views. Mutanga (2017:139) argues that governments are the custodian of policies that regulate education that includes special schools and learning spaces. The author further suggests that there is a need to review policies to make sure that they address the implementation of including students with hearing impairments. For example, policies need to determine whether there is alignment in terms of processes at special schools and those at institutions of higher learning. Inclusive institutions acknowledge that students are unique and have different needs. These institutions have inclusive policies, resources provision for all, learning spaces that cater for all, and confirmation that teaching methods accommodate all. South Africa currently has special schools that focus on basic education for people with disabilities, but there are no special higher education facilities to assist the same students in furthering their studies. It is important that government should start to reconfigure the basic education system by integrating students with special needs at basic education level to ensure that they do not experience insurmountable difficulties when entering tertiary institutions.

Howell and Lazarus (2003:60) remark that even though there are promises that are made in the policy framework concerning inclusive education and the establishment of a fair higher education system, careful consideration should be given to the obstacles inside the system that limit access, those that limit or prevent actual participation, and therefore reduce reasonable chances of success for all students. The interrelatedness of access, participation and success in the creation of equity is not yet fully understood and should be carefully investigated, explained and addressed. Although this study is concerned with the higher education system, it draws strongly from recent policy shifts and their underlying discourses in South Africa and internationally regarding what can broadly be described as the building of inclusive education and training systems.

2.4 POLICY FRAMEWORK

According to Howell and Lazarus (2003:64), a lack of curriculum flexibility in higher education is why students with hearing impairments are experiencing challenges. These challenges are related to an unfair education system that does not accommodate students with hearing impairments during teaching and learning. A policy framework is necessary in order to have flexibility within teaching and learning. The framework should serve as a guide during the development of policies. It should outline who is responsible for the approval of the policy, when the policy will be implemented, how it will be published and reviewed, and who the custodian of the policy is. The framework also ensures that there is uniformity in the way things are done in terms of processes and procedures. The admission policy at the university of technology that forms the focus of this study was last revised and approved in 2009.

The policy framework consists of the following:

• Definitions	Are explanations of terms, which are currently used within universities and across the higher education sector.
• Roles and responsibilities	All staff members who are responsible for policy development ought to be familiar with the framework, and ensure that their policies comply with it. The office of the registrar is responsible for the circulation of the framework to all staff and publish the framework on the university website.
• Policy development guide and template	Each policy must have an owner. The custodian of the policy will be responsible for the development, distribution, maintenance and review of policies, and ensure that these comply with legislations. Operational policies such as policies on enrolment, examination, teaching and learning, and graduation should address the needs of students with special needs, focusing, for the sake of this study, on students with hearing impairments. Figure 2.1 shows the operational management processes.
• Policy approval	All newly drafted or reviewed policies are subjected to an approval process before implementation. The four stages are consultation with all key stakeholders, equality impact assessment, approval, and implementation. It is important to ensure that a new or reviewing policy process is fair,

	transparent, legal and consistently applied. Policies must not negatively affect individuals by virtue of them being part of a protected group under the Equality Act. The university's executive management council and its senate must approve all academic policies pertaining to fee and student regulations because of the wide impact of such policies across the university.
• Implementation and communication	The policy owner is responsible for effectively communicating to all target audiences about the new or reviewed policy. A policy must be promoted to ensure that there is buy-in by all affected by it. The policy owner is also responsible for support and for scheduling workshop so that there is communication to all users for clarity and adherence to the policy
• Storage	All institutional policies must be listed centrally on the university homepage where they can be freely accessed by all users. The office of the registrar is responsible for ensuring that all policies are uploaded to the university portal.
• Reviewing process	It is vital for policies to be reviewed regularly to ensure that they remain relevant and comply with current legislation and regulations. The custodian of the policy to establish the reviewing cycle.

• Compliance	The custodian of the policy is accountable for ensuring that there is compliance with legislation, especially within the education spectrum. The policy should be aligned with the following legislation documents: White Paper on Persons with Disabilities 2015, the Constitution of the Republic of South Africa, and the United Nations Declaration on the Rights of Indigenous Peoples, as well as the Right to Education for Children with Disabilities.

The focus of this study will be on the implementation of the current policy which the university approved in 2009. It is a waste of time and resources to develop a policy without implementing it. David (2013:247) describes policies as rules and regulations that govern processes and procedures set by institutions to achieve desired goals. Pearce and Robinson (2009:314) indicate that policies give direction for managers on the steps to take while executing their daily decisions. Policies serve as guidelines that assist managers and employees in executing their daily decisions in an organisation, so that there are no deviations from the strategic objectives of the organisation. Thompson, Strickland and Gamble (2010:359) highlight that policies ensure that decision makers do not go overboard with their decisions as they are limited to working within the standard processes and procedures of the organisation. Policies are clear in nature as they stipulates who is responsible for decisions, how to delegate responsibilities, and what can and cannot be done while executing administrative responsibilities by managers. Policies not aligned with organisational strategies can create some challenges when coming to the implementation of that strategy. Managers should review policies regularly to ensure that they are aligned with new strategies and make sure that operational processes will support effective implementation of the new strategy.

Mutanga, Manyonga and Ngubane-Mokiwa (2018) argue that some regulations which have already being approved and passed into law but cannot bring about change, need to be reviewed and revised. The framework encourages provisions in the education sector that support participation of persons with disabilities. DHET as the leader of institutions of higher learning is responsible for monitoring the institutions and make sure they develop policies and implement them. Institutions still find it difficult to make some alterations to infrastructure because of the financial implications to reconfigure lecture halls and residences in order to make them accessible to students with special needs.

According to Matshedisho (2007:697), many institutions have a disability policy only because they are required to have one by law, and therefore they do not necessarily apply the principles of the policy. Disability policies are seldom converted into practice. Institutions will proclaim their commitment to the implementation of the policies for staff and students with disabilities by ensuring that there are equal opportunities, equal access to education, and equal employment. This is however not always what is happening in practice. Claiborne, Cornforth, Gibson and Smith (2011:514) state that in New Zealand a study was conducted with the intention to establish whether tertiary institutions are in compliance with implementing policies on inclusive education as mandated by the state to increase access for students with hearing impairments. Educational policies in New Zealand play a vital role in ensuring that institutions of higher learning support the need for special education.

This study will test if the policy framework of the university of technology concerned is implemented in line with the framework designed by the DHET. Ryan (2011:74) observes that even though there are measures put in place by government in terms of regulations and funding,

the number of students with hearing impairments in most institutions remains insignificant. DHET South Africa (2014:5) believes that the introduction of the policy on persons with disabilities has played an important role in increasing the number of students with disability at institutions of higher learning, but the policy has not improved students' participation.

The policy framework, according to the DHET South Africa (2014:2), "… is therefore situated within the context of taking into account market forces, geographical location; and institutional strategies linked to an applicable mission statement; social or community expectations and pressures; internal dynamics, legacies and the capacities of the institutions. The policy framework should be an enabling and coherent policy framework that includes thoughtful governmental supervision, effective steering, predictability, continuity and consistency in policy". DHET South Africa (2014:2) emphasises that a policy framework is supposed to bring synergy in the education sector starting from primary, secondary, and tertiary education, including technical and vocational education and training (TVET), colleges, sector education and training association (SETA), communities, private and public sector and all sponsors, with the purposes of making education accessible to all. Collaborations among institutions will bring reform on the type of courses offered.

2.5 THEORETICAL FRAMEWORK

2.5.1. LANGUAGE OF INSTRUCTION

The South African government recognises 11 official languages; a demonstration of the country's diverse population reflecting a variety of ethnic groups, many of which have a great deal in common in terms of background, culture, and descent. Although SASL is recognised in the Constitution of the Republic of South Africa (1996) as the language for students with hearing

impairments, more need to be done to integrate the language as part of their teaching and learning at schools. SASL is the language medium through which students with hearing impairments gain equal access to an education comparable to that of their hearing peers. Antia, Jones, Luckner, Kreimeyer and Reed (2011:502) suggest that in order to improve access into education for children with hearing loss, more needs to done, such as awareness within communities, improved classrooms and providing assistants in the classrooms. If there can be early identification and intervention, students with hearing impairments will not have to struggle in terms of placement at schools because they will be able to attend local schools, the communication gap between them and their peers, who are able-bodied, will improve.

2.5.2 RECRUITMENT OF STUDENTS WITH HEARING IMPAIRMENT

This study will not focus specifically on the recruitment of students with hearing impairments, but rather on the internal processes within the institution. Prowse (2009:89) states that most governments', as part of the objectives, are advocating that institutions of higher learning should make an effort to recruit students from disadvantaged groups, which is key in ensuring that there is inclusion of this group and their need for access into education are realised. Institutions making effort by increasing access for students with special needs should be supported financially by the state so that they can accommodate more students. It is government's responsibility to ensure that institutions are held accountable regarding the inclusion of persons with disabilities.

2.5.3 ENROLMENT OF STUDENTS WITH HEARING IMPAIRMENTS

The enrolment of students with hearing impairments is not only a South African challenge, but also an international one. Many developing and developed countries are still faced with challenges

in this regard. Richardson (2010:195), in a study focused on a United Kingdom context, says no justification is given by institutions on why there is still underrepresentation of students with hearing impairments at institutions of higher learning. Institutions cannot produce concrete results that confirm that students cannot perform well at university level. The fundamental point is that the representation of students with hearing impairments at institutions of higher education still remains underrepresented as compared to hearing students of the same age group.

Eckes and Ochoa (2005:19) suggest that there is a need for collaboration between basic education and tertiary education to ensure that education systems allow integration from basic education into tertiary education. They further indicate that university staff should develop interest in knowing the needs of students with hearing impairments. Moloi and Motaung (2014:374) argue that the aim of government is to draft and regulate legislation to ensure that institutions of higher learning increase the enrolment of learners with special needs. Government also ensures that higher education institutions submit plans and time lines on compliance and these institutions are accountable to government. Institutions are obliged to implement policies on persons with disabilities and give support to students. Any challenges that institutions may experience should be addressed in line with the framework on human rights. The implementation of the policy on persons with disabilities will assist in ensuring that there is flexibility, free accessibility, and support in the learning spaces for all students, including students with hearing impairments.

2.5.4 LEARNING SPACES

Matshedisho (2007:687) states that some institutions of higher learning have a unit which is tasked with the responsibility of giving support to students with disabilities, including students with hearing impairments. The purpose of these units is to advocate for students with disabilities,

provide support and guidance to students, and ensure that students adjust well in the institutions' learning spaces. They ensure that institutions appoint qualified sign language interpreters, note-takers, and tutors, and they provide assistive devices to students to support them during their learning journey. These units also ensure that invigilators are provided during assessments and that extra time is given to students during tests and examinations. These units also assist students with hearing impairments with computer training and provide interventions related to physical access to buildings, and assistance regarding students' loan and bursary applications. In many institutions, these units are referred to as a disability unit. Highly specialised staff are appointed who are trained to work with persons with disabilities.

2.5.5 SUPPORT STRUCTURE

According to Matshedisho (2007:686), the South African higher education system is designed in a way that denies the rights, goodwill and social model of the disabled, as disabled students are expected to excel in structures designed for their peers who are abled. However, the institutions of higher learning in South Africa acknowledge that persons with disabilities also have rights like any other students and they must given support when exercising those rights. Students with hearing impairment have human rights like any other persons and they must be given the same opportunities to study at institutions of higher learning and be treated fairly. All institutions are expected to develop a policy that support the rights of persons with disabilities as mentioned in the Constitution of the country, and any challenges they may encounter must be resolved within policy.

Antia, Jones, Reed and Kreimeyer (2009:309) point out that teachers of students with hearing impairments should put more effort on improving their communication skills which will assist in

communicating with students rather than trying to change challenges of the past which are difficult in nature. Communication will not only assist students in classrooms but will bridge the communication gap between teacher and students. In order for students to be able to excel in an academic career there should be a form of communication between them and their teachers. The use of interpreters is another form of communication by students as they translate the spoken language into sign language. Students with hearing impairments will not be able to participate in learning experiences without the support of interpreters. Moloi and Motaung (2014:373) argue that students with hearing impairments experience challenges in life due, among other concerns, to their disadvantaged literacy level. They also emphasise the important role sign language interpreters play in assisting students in overcoming those challenges.

Schick, Williams and Kupermintz (2006:3) suggest that access into institutions of higher learning by students with hearing impairments will remain a challenge simply because of a lack of qualified interpreters who are able to translate in academic spaces. Some interpreters available are not able to comprehend higher-level education because many of them receive basic training only. The terminology being used at higher education and the style of teaching may be difficult to comprehend unless interpreters themselves received higher education. Unless teachers change the way they conduct their teaching in the classrooms, interpreters will not be able to translate accurately for students with hearing impairments. Teaching and learning at institutions of higher learning were designed for hearing students. Incorporating students with hearing impairments in the same system will continue to disadvantage this group of students. Qualified interpreters need to have a variety of skills such as intensive spoken language, understanding specific methods of teaching and learning, and the terminology being used in academic environments in order to be

able to efficiently translate communication for students with hearing impairments in their academic journey.

2.5.5.1 DEGREES OF HEARING LOSS ACCORDING TO BETTER HEARING INSTITUTE

A study by the Better Hearing Institute (2018) found that hearing loss can manifest at four levels, namely minor, moderate, severe and profound hearing loss. It is important that higher education institutions understand the extent of the hearing loss of students in order to assist them with relevant resources. The four degrees of hearing loss are briefly explained below.

(a) Minor

Minor is a type of hearing loss which is not easily noticed as people with minor hearing loss can still hear and communicate with others but might struggle with those speaking in a low voice. People with minor hearing loss can communicate with others without making use of a hearing aid.

(b) Moderate

People with moderate hearing loss might find it difficult to comprehend sound between 40 and 60 decibels. According to the Better Hearing Institute, speech averages between 50 and 65 decibels.

(c) Severe

People with severe hearing loss require the use of hearing aids as they will find it difficult to communicate to hear others. Many within this category have difficulty to hear sound below 61 and 80 decibels.

(d) Profound

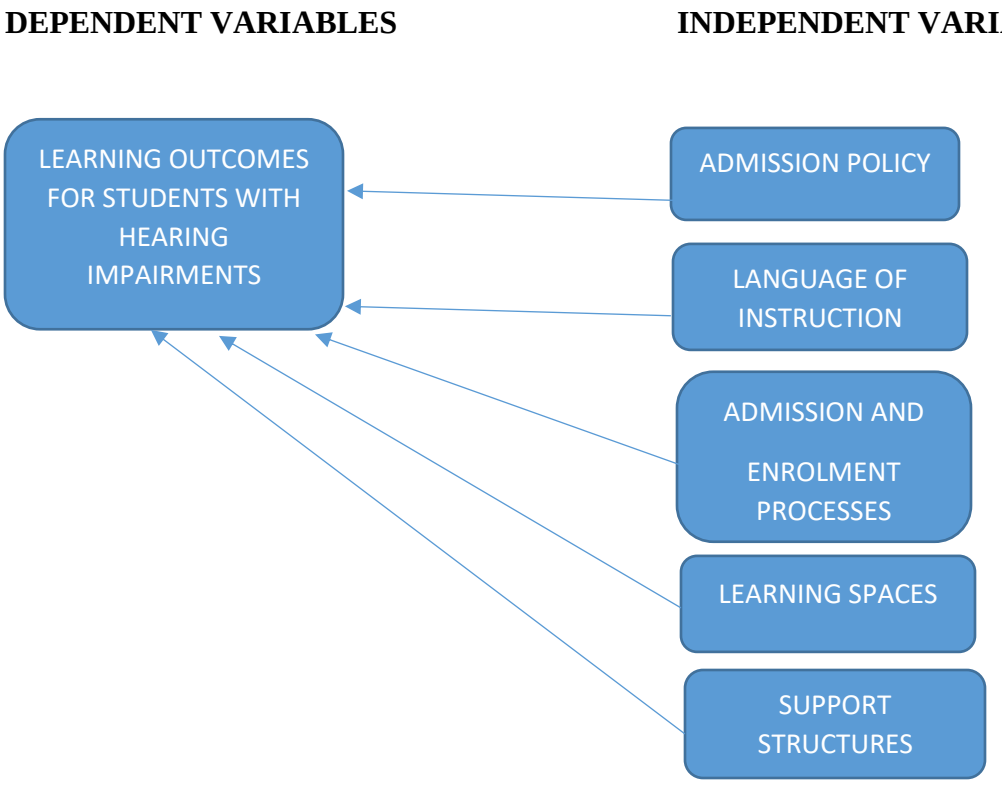
People with deep hearing loss cannot hear at all and the use of assistive devices cannot assist them. This group of people depend on the use of sign language interpreters or sometimes they simply follow people's lips when they are speaking.

In this study, all degrees of hearing loss will be covered by the term ‘hearing impaired’.

Theoretical framework

The success or failure of the learning outcomes of hearing-impaired students is influenced by the following factors listed in figure 2.1. The model demonstrates the dependent variable as well as independent variables, which play a key role in the study. The success of students with hearing impairments is a dependent variable and is supported by independent variables such as admission policy, language of instruction, admission/registration processes, learning spaces, and support structures. Above all these factors, admission policy plays a vital role in terms of granting access or even preventing learners from gaining access. The variables depicted on the model demonstrate the relationship and how each variable impact on the success or failure of students with hearing impairments in the academic journey.

Figure 2.1 Theoretical framework



2.5.5.2 VARIOUS TYPES OF SUPPORT SERVICES

Students with hearing impairments have special needs and require assistance from various divisions in a higher education institution in the course of their academic studies.

(a) Required resources for students with hearing impairments

A university should ensure that students with hearing impairments are provided with all the support needed during admission, and while they continue with their studies on university campuses.

(b) Career guidance

The division for student development and support's disability unit often provides career guidance to prospective students. They advise prospective students who are hearing impaired about the qualification choices available to them, and on how to make the right choices to ensure that the complete academic journey is successful.

(c) Human support

Students with disabilities are offered financial support in the form of bursaries by the Department of Labour, private companies and the National Student Financial Aid Scheme (NSFAS). As part of their bursaries they are allocated additional funding for assistive devices, which can be used to buy any kind of materials and equipment that would assist them during their studies. The Disability Student Allowance (DSA) and International Disabled Students Fund (IDF) can provide or make a significant contribution to the cost of this support. The use of sign language interpreters is key in the academic success for students with hearing impairments. Without human support in the form of sign language interpreters, students with hearing impairments will not be able to survive in the higher education learning spaces.

(d) Academic support services

In a study conducted by Vickerman and Blundell (2010:21), they found that the higher education sector is still lacking behind on the implementation of policy on inclusive education as compared to the basic education sector. Higher education needs radical revamp and modification processes in order to give access to students with hearing impairments. Curriculum design must be inclusive of all students and fairer than the manner in which it is currently designed. All forms of barriers in the system must be eradicated.

(e) Technological support

Students with hearing impairments need support in a form of assistive devices such as hearing aids and note-taking in the classroom and outside the classroom during their academic journey. Without assistive devices, many students with hearing impairments will not be able to succeed academically. According to White Paper on Persons with Disabilities (South Africa, 2015b:3), "Assistive technology it is an umbrella term that includes assistive, adaptive, and rehabilitative devices and services for persons with disabilities, which enable persons with disabilities and learning differences to attain independence. They include for example, loop systems, sub texting and alternative input for cognitive assistance and computer or electrical assistive devices".

2.5.5.3 OPERATIONAL MANAGEMENT OF PROCESSES AND SUPPORT FOR STUDENTS WITH HEARING IMPAIRMENTS

The officers at information services, admission, registration, academic departments and the examination and graduation divisions play a pivotal role in the integration of students with hearing impairments into the university system. Slack, Brandon-Jones and Johnston (2013:6) describe operations management as a process whereby organisations manage their value-chain activities in a manner that will produce services to their clients. Operations performance is vital for any

institution. Flexibility means processes should be able to adopt to changes when the need arises. This means changing what the operation does, how it does it, or when it does it. Students with disabilities require some institutional operations to change so that they can provide flexibility. University processes need to be flexible to accommodate new developments or changes, as well as differently abled students.

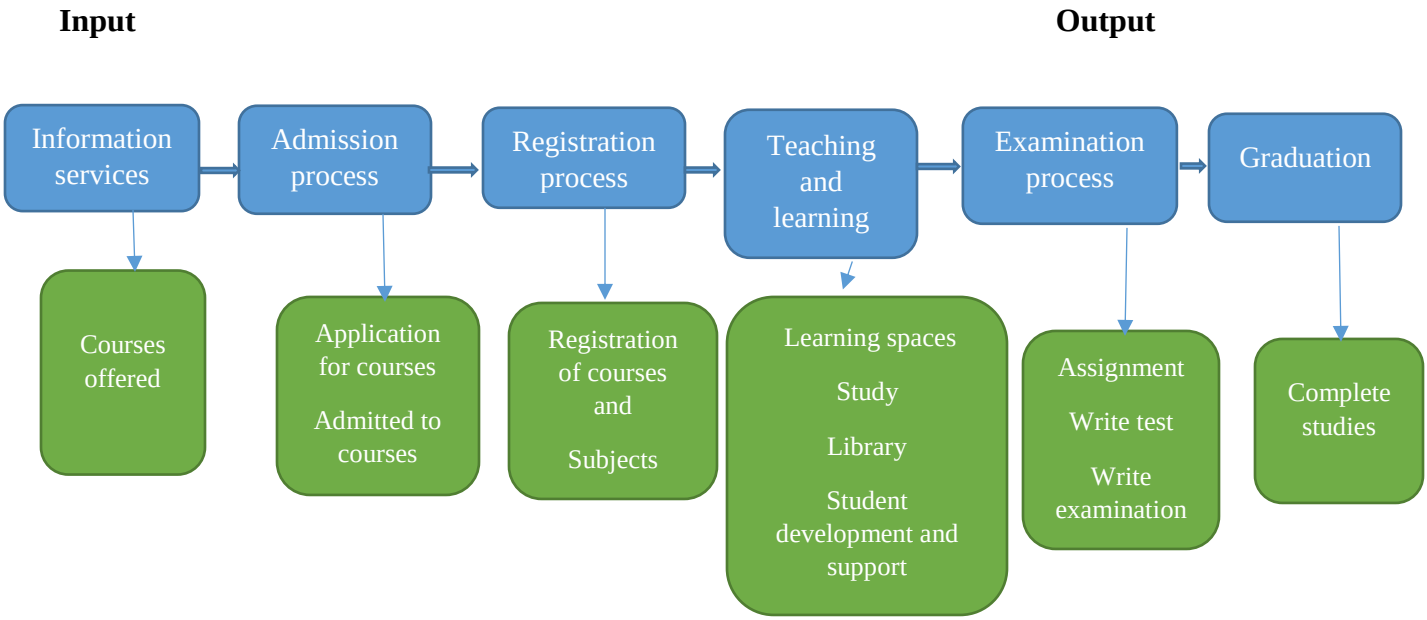


Figure 2.2 Operational processes

During the abovementioned operational processes support is needed for students with hearing impairments. The institution must ensure that the operational processes are managed in accordance with the relevant policies and that students are not discriminated against because of their disabilities. All barriers that might hinder the smooth running of these processes with reference to persons with disabilities must be minimised. Sign language interpreters are key in these processes for hearing-impaired students, from the day a student is admitted to a qualification, until the day he or she graduates and exits the university system.

(a) Information office

Information officers are the first staff who students with hearing impairment meet when they visit a university of technology. Those staff members need to know how to handle students with hearing impairments and should be aware of the type of support that is needed when hearing-impaired students visit the university. Information officers communicate information about the qualifications available at the institution and about these qualifications' admission requirements.

(b) Disability unit

The disability unit or disability officer plays a key role at any institution in the support of students with hearing impairments. The officers assist students and ensure that they register all students with disabilities on the database, regardless of the kind of disability. They also ensure that students with hearing impairments obtain access to university qualifications and to the services and activities available at the university.

The unit also advises management on resources that could assist students in accessing learning spaces and experiences, and ensures that assistive devices are made available to students. The unit works in collaboration with other divisions, such as the financial aid office, registration, assessment office, library and graduation office, for the advancement of students with hearing impairment and their specific needs. They also work closely with the student counselling division to ensure that students become independent and develop strategies for lifelong independent management. The officers liaise with the financial aid office to ensure that funding is made available to students with disabilities, and they liaise with management to ensure that competent sign language interpreters are made available for those students.

(c) Admission and registration office

Admission and registration officers enter qualifying students on the university system or help them to register online, and ensure that they follow the steps towards registration of the qualification and modules. They provide printed documents such as university proof of registration and student rules and regulations. This office refers students to the relevant academic department for orientation and to receive communication about the commencement of classes and timetables.

(d) Financial aid office

The role of the financial aid office regarding students with hearing impairment is to distribute financial aid funds to students, to allocate funds for assistive devices, and to provide leaving allowances and allocate funds for learning materials.

(e) Academic departments

According to de Boer, Pijl and Minnaert (2011:331), university lecturers are important role-players in the implementation of inclusive education. Change of education systems or a change in the way of doing things requires the buy-in of all role-players. Without their support it will be difficult to implement it successfully. University lecturers should take it upon themselves to learn about the needs of persons with disabilities, especially students with hearing impairments, as this will assist them in providing support to students during their academic journey. Loe and Feldman (2007:647) emphasise that, for students with hearing impairments to able to succeed academically, academic departments need to provide services such as accommodating those students in various ways, allocating special venues for completing summative assessment, and giving extra time during assessment.

2.5.6 UNIVERSITY POLICY ON PERSONS WITH DISABILITY (UoT)

According to Tshwane University of Technology (2018a), the institutional policy of the university states that "the University is committed to the fair and equal treatment of all individuals, and, as an institution of higher learning, strives towards an inclusive mode of education. TUT acknowledges that people with disabilities have the same right to reach their academic and professional potential as those who do not have a disability and are able-bodied. TUT is thus legally and morally bound and committed to a course of action that will increase its accessibility to students with disabilities and the extent to which they are accommodated. In order to address this matter in a responsible manner and to achieve the goal of inclusive education, structures and policies need to be put in place to deal with matters pertaining to such students. All actions resulting from the implementation of this policy will be governed by the financial capacity of the University". The policy is clear on the university's commitment.

2.5.6.1 Rights and responsibility of a university of technology

According to Tshwane University of Technology (2018a), students' rules and regulations state that: "the University accepts the responsibility to provide a morally and legally sound practice in providing for and managing disabilities. The University will provide a Disability Office to facilitate and monitor all aspects stated in this policy. The University will provide basic counselling and support on a client-centred basis in the same way that it is offered to all students on University campuses. The University accepts the responsibility to inform the applicant on time of its ability to provide infrastructure, adjust procedures, or meet any other predetermined need. The University reserves the right to review the pre-admission contract with stakeholders, should any change in

status or degree of disability occur. The University will hold the student responsible for adhering to all general rules and regulations as published in this Prospectus".

2.5.6.2 Rights and responsibilities of persons with disabilities

According to Tshwane University of Technology (2018a), students' rules and regulations states that "it is the right and responsibility of a prospective student with a disability or disabilities to declare his or her disability or disabilities when he or she applies for admission to TUT, and to negotiate support with the Disability Office. It is the right and responsibility of a prospective student or current student with a disability or disabilities to acquaint him- or herself with the policy and all procedures regarding disabilities. It is the responsibility of a student with a disability or disabilities to report a relevant grievance to the Disability Office".

2.5.7 SUMMARY

Students with hearing impairments have special needs, which need to be catered for at all universities, including the university under study. These students need special support from, among others, the disability unit and administrative staff from different divisions such as information, registration, examinations, the library, academic departments, and the graduation offices. The support structures at universities across the globe, including universities in South Africa, were considered. Support resources such as assistive devices and sign language interpreters can enhance students' academic performance and adjustment at higher education institutions. Sign language is the main means of communication for students with hearing impairments. Without sign language interpreters, these students will not be able to succeed academically in institutions where most of the student body is not hearing impaired.

Policy implementation on inclusive education at higher education institutions is vital. Although many higher education institutions have policies in place that govern access by persons with disabilities, some institutional policies have never been implemented. Funding remains a problem for some institutions because the implementation of inclusive education requires extra resources such as infrastructure and human capital. Political will and support from government officials, especially the DHET, on the implementation of policies is vital. More disability awareness campaigns are necessary for university staff.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the research process in detail in terms of the paradigm, research design and research method used in the study. The method of data collection and the data analysis process are discussed. For the research design, the study adopts a positivist approach and utilises a quantitative research design. All moral and value principles that govern ethics in research are also considered in this study. The researcher uses quantitative research design in order to investigate the barriers affecting access to higher education by students with hearing impairments at a university of technology (UoT).

3.2 RESEARCH AREA

The study was carried out at a university of technology (UoT), which is a public university in South Africa with campuses located in the Gauteng, North West, Mpumalanga, and Limpopo provinces. The university has approximately 5 000 staff members spread across all campuses.

3.3 RESEARCH OBJECTIVES

While the rationale for the study was discussed in Chapter 1, the purpose of the study will be explained here. The objectives of the study are listed below:

The purpose of the study is to determine barriers to implementation of policies to access to institutions of higher learning by students with hearing impairments, so as to inform frameworks that will increase access for potential students with this special need;

- To assess the university's readiness to enroll students with hearing impairments, and;
- To establish whether there is adequate support for students with hearing impairments to experience a successful academic career.

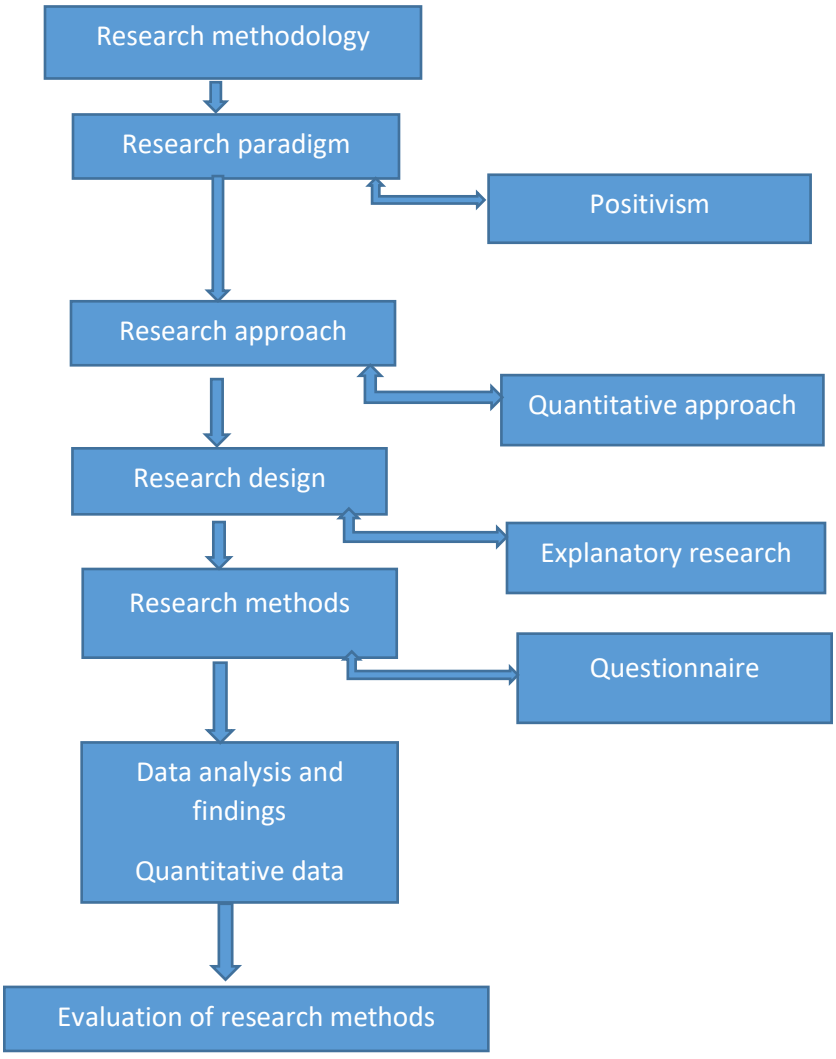


Figure 3.1: The road map of the research methodology for the current study

3.4 RESEARCH DESIGN

According to Blumberg, Cooper and Schindler (2011:147), "research designs is the plan and structure of investigation so conceived as to obtain answers to research questions. The plan is the overall scheme or program of the research. It includes an outline of what the investigator will do from writing hypotheses and their operational implications to the final analysis of data. A research design expresses both the structure of the research problem and the plan of investigation used to obtain empirical evidence relating to the problem". In this section, the researcher outlines the philosophical approach the study followed, the methodology, the structure of the study, the type of instrument to be used to collect data, and indicates the type of data to be used, how it will be collected, and from whom.

The research employs a quantitative research methodology. This quantitative study is anchored in the positivistic paradigm. The study will follow a positivist philosophical paradigm using a quantitative methodological approach. According to Welman, Kruger and Mitchell (2005:6), the positivism approach is one of the philosophical approaches that is independent of the researchers. A principle of positivism is that respondents present their opinion or facts without the influence of the researchers. The responses are from the respondents' point of view and not that of the researchers. In a quantitative research design, a researcher attempts to establish the facts by conducting a research study from the viewpoint of outsiders. The researcher should separate themselves from the data collected and allow the respondents to express their own opinion on the topic being investigated, so that the process is hypothetically free from bias. Creswell (2015:5) notes the advantages and disadvantages of quantitative study.

Table 3.1: Advantages and disadvantages of quantitative research

Advantages	Disadvantages
• Draws conclusions for large numbers of people • Analyses data efficiently • Investigates probable causes and effects • Ensures that bias is limited • Appeals to people's preference for numbers	• Is impersonal, often dry • Does not record the words of participants • Provides limited understanding of the context of participants • Is largely researcher-driven

Hernández (2015:96) explains that a positivist paradigm is more relevant to quantitative research than other philosophical approaches. A positivism approach supports theories that suggest harmony between the question and processes to be followed when collecting data from participants. By using an explanatory research approach, the study will attempt to investigate the extent to which policies on access to education is implemented. According to Garg (2016:74), questionnaires are suitable for explanatory research. Quantitative data will be collected by using structured survey questions, and these survey questions will be conducted individually for all respondents. In this design, a structured questionnaire will be utilised as an instrument to collect quantitative data. Data will be collected from institutional support in the registrar's environment, from administrative staff at academic departments, and from academic heads of department.

The study will follow categories that constitute quantitative research, as illustrated by Welman, Kruger and Mitchell (2005:78) in Figure 3.2 below. The hypothesis articulates the effect that the

independent variable is anticipated to have on the dependent variable, and it is this effect that the researcher measures in the research. The researcher will also measure the level to which the intervention (independent variable) has improved or affected the units of analysis (dependent variable).

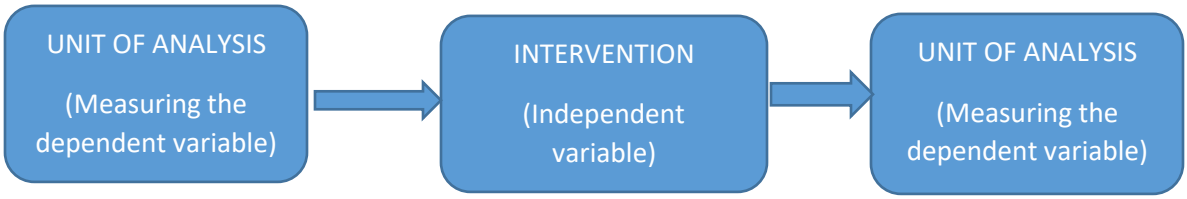


Figure 3.2: Unit of analysis

In this design, a structured questionnaire will be utilised as an instrument to collect quantitative data. The questionnaire will be self-completed using the internet, and respondents will access the questionnaire using a hyperlink.

The advantages and disadvantages of using questionnaires, according to Grademiners (2017)

The questionnaire is a structured technique for collecting primary data in a survey.

Advantages of using a questionnaire

- The use of questionnaires is more cost effective than face-to-face interviews.
- Questionnaires are easy to analyse, and data can be entered easily by using computer software packages.
- Questionnaires reduce bias, as the researcher does not have influence over the responses to be completed by the participants.

- Written questionnaires are less of a disturbance than other forms of research; the participants can complete them at their own time and in their own space.

Disadvantages of using a questionnaire

- Questionnaires sometimes have low response rates from participants and may lead to inaccurate statistical analyses
- Questionnaires do not allow any flexibility for the respondents

Since the aim of the study is to establish whether the university is making provision for access for students with hearing impairments by adopting and implementing policies in line with government legislation, the researcher will use data collected to assess the readiness of the university in terms of human capital, processes and infrastructure.

3.5 POPULATION AND SAMPLING

3.5.1 Population

According to Salkind (2009:33) a population is the total number of participants or subjects that will be forming part of the research study. The total population of the study is approximately 463 staff members, comprising 23 information services staff, 250 staff members from the registrar's environment, 82 administrative staff from academic departments, 54 sectional heads from academic departments, and 54 academic heads of department, who will be invited to participate in the study (Tshwane University of Technology, 2018b). The study is limited to individuals involved in the admission of students. The researcher will not be able to receive feedback from every individual within the environments mentioned, as it might not be possible to get feedback from all staff. The researcher will however be targeting 10% of the staff members, which will be

representative of the identified staff. Data will be collected only from university staff, as the study is investigating the internal readiness of the selected university of technology.

The researcher made a list of all categories of the identified population of the study, and a list of the identified population will be requested from the human resource department. Individual participants will be randomly selected from the list according to their experience of working with admission of students. The sample frame will be used to stratify and randomly select employees from different units, who will eventually be requested to participate in this study.

3.5.2 Sampling technique

According to Blaikie (2009:174), stratified sampling ensures that there are enough numbers in the sample from all groups that are to be studied. In this study, a stratified random sample is used. Garg (2016:85) refers to stratified random sampling as "a modified version of random sampling where the population is divided based on specific criteria or attributes". University staff will therefore be selected from a population of staff in the information services, registrar's environment, administrative staff from academic departments, sectional heads from academic departments, and academic heads of department within the university during the research study. They will have the same chances of being selected. Probability sampling will be applied, giving all participants an equal opportunity to give their opinion. Saunders, Lewis and Thornhill (2016:276) indicate that probability sampling is usually associated with the study research approach whereby the researcher makes decisions based on the sample of the population. Decisions are in line with the questions asked during the research which will assist the researcher to achieve his/her objectives. The sample population is selected because of the level of experience the proposed population has for dealing with disseminating information on courses, admission, registration and examinations, and dealing with students' academic matters. The number of people

selected will be divided into groups according to their directorate; experience will be the determining factor to be considered. Proportionate stratified sampling was used where a sample was drawn from each group according to the number of units in the population. Individual samples were then combined into one in order to make the sample for the study.

3.5.3 Sampling size

Salkind (2009:33) states that sample size is the number of participants selected from the total population. This sample is calculated according to the number that will assist the researcher to reach certain conclusions based of the study. The researcher sets the criteria for the selection of the sample and determine how much sample is required. A sample will be selected from a population of staff in the information services, registrar's environment, administrative staff from academic departments, sectional heads from academic departments, and academic heads of department within the university.

Stratified sampling will be used to analyse data. Stratified random sampling will allow the researcher to increase the precision with the same sample size. According to Creswell (2014:159), when using a scientific study, at least a sample of 10% drawn from a large population is allowed in research. In this study, a sample of 10% drawn from each strata will be acceptable.

Table 3.2: Stratified sampling data

Staff categories	**Population**	**Stratified sample**
Information services staff	23	2
Staff in the registrar's environment	250	25

Administrative staff from academic departments	82	8
Academic sectional heads	54	5
Academic heads of department	54	5
Total	**463**	**45**

Data will be collected only from staff of this university, as the study will be investigating the internal readiness of the selected university of technology. The study will therefore be applying probability sampling to give all respondents an equal opportunity to give their opinion. Stratified sampling will be used to analyse data. Statistical data analysis will be used to determine the general conclusion on the data received. No prospective or current students will be involved in the study, as the purpose of the study is to investigate factors that affect their access into the system. The study uses stratified random sampling as indicated, and the questionnaire will be an instrument to collect responses.

3.6 DATA COLLECTION

The research design determines the instrument to be used to collect data. In this study, structured questionnaires will be utilised as an instrument to collect quantitative data. The researcher will collect data according to the schedule of activities approved in the proposal. The researcher plays an important role during data collection and analysis. Wisker (2007:187) describes a questionnaire as a tool designed by the researcher that consists of questions with the intention of receiving information from respondents for the study. The survey questionnaire is commonly used in business and management research and is most regularly used to answer questions like ‘what, who,

where, and how'. Data will be collected using closed questions. A closed question is a simple question that expects a short answer and the researcher opted for an Interval (rating) scale, mostly using Likert-style rating.

Blaikie (2009:160) explains that a researcher compiles the questions to be included in the study, ensures that the question addresses the objectives, also sends out the questions to respondents, interprets the results received and writes a report. These are new information used to respond to a particular research question. Primary data will be collected from university information services staff, staff from the registrar's environment, administrative staff from academic departments, sectional heads of academic department, and academic heads of departments. Quantitative data will be collected by investigating scaled survey questions. Survey questions will be conducted individually for all participants. No data will be collected from applicants or students, as the study is to investigate the readiness of the university in terms of processes and infrastructure.

3.6.1 Questionnaire design

Structured questionnaires are the most suitable for the study, as the questions will be tailor-made according to the research objectives of the study. It is important to design questions that are suitable for the study, but that will also allow participants to provide answers without compromising any confidentiality clauses. The questionnaire is separated into two sections. The first section focuses on the administrative questions that include variables such as employment category and management level. The second section comprises of target questions, which are university-related questions, and which will address the investigative questions of the study. Some questions require Yes or No answers, while other questions use the five Likert scale questions: strongly agree, agree, undecided, strongly disagree, and disagree.

3.6.2 The layout of the questionnaire

The layout of the self-administered questionnaire has been designed to be appealing, not overwhelmingly long, and user-friendly. This will encourage the respondents to complete it and return it. A cover letter will be used to introduce the study and explain its purpose. Participants will be informed that the study will be done in partial fulfilment of the requirements for the researcher's MBA degree.

3.6.3 Pilot study

Garg (2016:83) describes a pilot study as a method used to check the correctness of a questionnaire in terms of the wording or the instructions given, and to ensure that the questions are easily understood. Pre-testing also assists in ensuring that all study variables and important information are included during the data-collection process. A pilot study, according to Hassan, Schattner and Mazza (2006:70), is "a small study to test research protocols, data collection instruments, sample recruitment strategies, and other research techniques in preparation for a larger study. A pilot study is one of the important stages in a research project and is conducted to identify potential problem areas and deficiencies in the research instruments and protocol prior to implementation during the full study". Polit and Beck (2006:296) define a pilot study as a trial test of limited information collected in order to verify whether the instruction in the questionnaire is clear and easily understandable by others and to check if the information addresses the objectives of the study.

In order to ensure that the content and instructions on the questionnaire are clear and free of errors, a scheduled pre-test will be done selecting a few staff members from the administrative staff, sectional academic heads, and academic heads of departments. The purpose will be to verify the

clarity of questions, to identify questions that might not be relevant, and to add new questions where required. The researcher will briefly explain the objectives of the study to the participants.

3.6.4 Reliability and validity of the questionnaire

The pilot testing process will help to determine whether the questionnaire addresses the objective the researcher set out to achieve in the study and assists in giving expected results. The answer to be provided by participants should be as reliable as possible. This means that if the design of the study is not well structured, the study will not have valid results. According to Curtis and Curtis (2011:15), reliability looks at information produced after research to check if the information provides expected results and if various researchers, when using the same information, will arrive at the same conclusion or not. Validity states whether the researcher trusts this information or not and how truthful the information is.

3.7 DATA ANALYSIS

Data analysis, according to Investor Words (2018), is the process whereby the researcher after receiving responses to convert data in a manner using various statistical tools that will assist in producing results. The researcher then write a report from the results with the intention of arriving at a conclusion. In this study, the data will be analysed using a statistical analysis technique of quantitative research.

Garg (2016:86) states that there are three types of statistical operations in research, namely descriptive statistics, correlation/linear regression analysis, and inferential statistics. These statistics are used to contribute when analysing information. The researcher will use descriptive statistics (frequencies and percentages) to analyse the data as an aid to try to comprehend the strength or the extent of the connection between variables. The researcher will be using the word

correlation and regression analysis interchangeably during the study. Correlations demonstrate the strength of connection between two or more variables, but do not specify the cause and effect of the relationship. For the purpose of this study, the linear regression model will be used to find out the reliance association of factors of interest, namely policy implementation, access, operational processes and resources. Garg (2016:94), states that the linear regression model is very relevant to this study. Regression is commonly used to measure the extent of the relationship between two variables, which are dependent and independent variables.

3.8 ETHICAL CONSIDERATIONS

Izet (2015:3) summarises ethical principles in research as follows: "honesty, fairness, truthfulness, carefulness, openness, and respect for intellectual property, confidentiality, responsible publication, responsible mentoring, and respect for colleagues, social responsibility, non-discrimination, competence, legality, animal care, and human subjects' protection". According to Blumberg, Cooper and Schindler (2011:114), "ethics is the study of the right behaviour and addresses the question of how to conduct research in a moral and responsible way. Ethics then are moral principles, norms or standards of behaviour that guide moral choices about our behaviour and our relationships with others". In this study, the university management will first have to grant approval for research to be conducted involving the university staff. Permission to conduct research was requested from the university's ethics committee and the applicable university structures. Participants will give informed consent by indicating on the questionnaire that they understand the content and that they agree to participate voluntarily. Research will be conducted in a dignified manner and the rights of participants will be respected.

- The researcher will conduct research in the most transparent and honest manner possible.

- Participants will be protected from any form of harm, whether physically or mentally.
- The researcher will secure informed consent from the university to conduct the study.
- A participant will have the right to withdraw from the study at any time.
- The research outcomes will not be published without consultation with the institution.
- No harm will come to research participants, and participation will be voluntary and anonymous.

Participation in this study is entirely voluntary. Respondents have the right to withdraw at any stage without any penalty or future disadvantage whatsoever. Their withdrawal will in no way influence their employment at the institution. To maintain a high level of autonomy, research participants will be expected to complete the questionnaire independently without assistance from the researcher. The study and procedures involve no foreseeable physical discomfort or inconvenience to participants. There will be no emotional discomfort in completing the questionnaires. There will be no physical exhaustion, as completing the questions will not take long. During the study, there will be minimal risks, discomforts or inconveniences to participants. The identity of participants and data collected during the study will be kept confidential. There will be no identification of participants on the questionnaires and final report documents. The identity of participants will under no circumstances be revealed to any person during and after the study. Data received during the research will be kept safe for the duration of three years, after which it will be destroyed.

The information received during the research will only be used for research purposes only and will not be used or released for any university staff member's employment-related performance evaluation, promotion or disciplinary purposes. The results will be used solely for research

purposes and to inform, review, and improve the current university processes and procedures that affect students with hearing impairments.

3.9 COST AND FUNDING

The university will not incur any cost related to the study. No personnel will be appointed to assist the researcher, except the language editor who will assist with the editing of the document at the cost of the researcher. The researcher will also incur the cost of printing and binding the document.

3.10 SUMMARY

This chapter discussed the research area, research design, population, sampling, data collection and instrument to be used to collect data during the study. The chapter also looked at the instrument for testing a hypothesis in relation to the objective of the study and explained the ethics of the research. The next chapter will focus on data collection and data analysis, and present the research results.

CHAPTER FOUR

DATA COLLECTION AND ANALYSIS AND THE PRESENTATION OF THE FINDINGS OF THE STUDY

4.1 INTRODUCTION

The previous chapter, Chapter Three, outlined the methodology applied in this study. The chapter covered the methodological approach, research approach followed, sampling process used, sampling frame implied, sampling size drawn from the population of the study, data collection methods, and research design.

This chapter will focus on presenting the findings of the study with the purpose of providing the results to the readers of the study. The findings of the study are based on the objectives, which were presented in Chapter One. For analysing and presenting the data, the researcher followed a quantitative approach to collect data through questionnaires, using a link which was sent to respondents electronically. Closed questions were used to obtain answers from respondents. Respondents were required to answer Yes or No, while a Likert scale was used for questions which required responses ranging from strongly disagree to strongly agree. Primary data received from respondents were transferred to an Excel spreadsheet and STATA/SE 14.0 was used to analyse data.

4.2 RESPONSE RATE AND PARTICIPANTS' PROFILES

The only method of data collection for the study was the questionnaire, which is quantitative in nature. The questionnaire was designed in line with the objectives of the study, which were to determine the barriers to the implementation of policies governing access to institutions of higher

learning by students with hearing impairments, to assess the university's readiness to enrol students with hearing impairments, and to establish whether there is adequate support for students with hearing impairments to experience a successful academic career.

When collecting data, a stratified sampling was applied by focusing only on the following divisions: registrar's environment, information services and academic departments. These divisions were selected because they are responsible for the implementation of the policies related to the admission and registration of students with hearing impairments. A total of 463 staff members were identified as potential participants in the study, but only those with experience were selected to participate.

Furthermore, when collecting the data, a total of 100 questionnaires were distributed from 5 June 2019 to participants in the registrar's environment, information services and in different positions in academic departments. For the purpose of this study only 10% of the total population was required. The 10% required based on the staff representation according to strata was 45 responses, but to ensure that there were enough responses, 100 questionnaires were distributed. The total responses expected per strata were information services, two (4.4%), registrar's environment, 25 (55.6%), administrative staff from academic departments, eight (17.8%), academic section heads, five (11.1%) and academic heads of department, five (11.1%). All responses received were presented with the use of bar charts.

4.3 PERSONAL DATA

In this section, the study needed to establish the division in which the respondents functioned and the type of position they held in those divisions. The researcher had to ensure that there was a

balance of responses from different categories as per the requirements of the study. This was to ensure that the sample study was representative of the entire population, based on the different categories.

4.3.1 Respondents according to divisions

The divisions were selected because they play an important role in ensuring that the admission policy is implemented within the university. The respondents were asked to provide the division where they were employed because the researcher wanted to ensure that the responses from each group were representative of those particular groups. The responses are as follows for the entire population: The researcher received 56 responses, more than the expected 45 responses. These include 17 (30.36%) responses from academic departments, which include administrators, academic sectional heads and academic heads of department, six (10.71%) responses from information services and 33 (58.93%) responses from the registrar's environment.

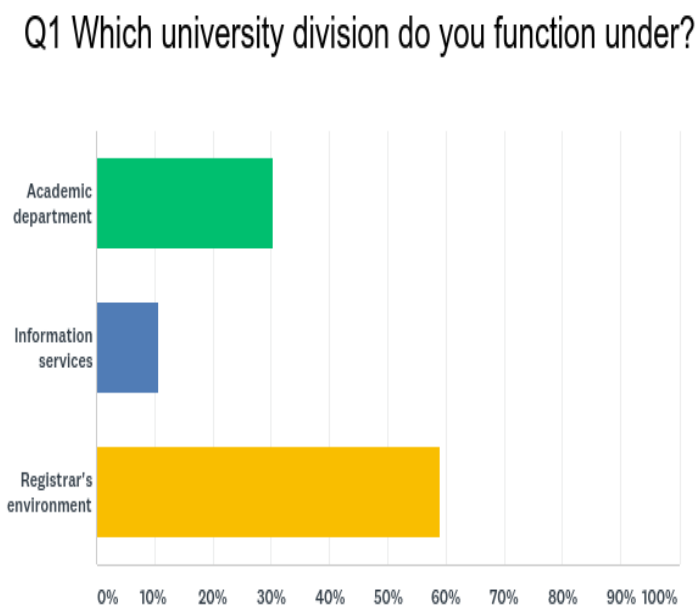


Figure 4.1: University divisions under study

4.3.2 Respondents according to category of employment

The study also focused on the respondents in terms of their category of employment. This was done to ensure that the respondents who have the first contact with students and those who have final decisions on admission matters are covered. The categories of employment per respondents were as follows: administrative staff, line managers, academic sectional heads and academic heads of department. The responses received per the categories of employment are as follows: administrative staff, 37 (66.07%), line management, 11 (19.64%), academic sectional heads, three (5.36%) and academic heads of department, six (8.93%). All employment categories submitted more responses than envisaged, except the category of academic sectional head, which gave only three responses instead of the expected five responses. This shortfall will not have an impact on the analyses of the results.

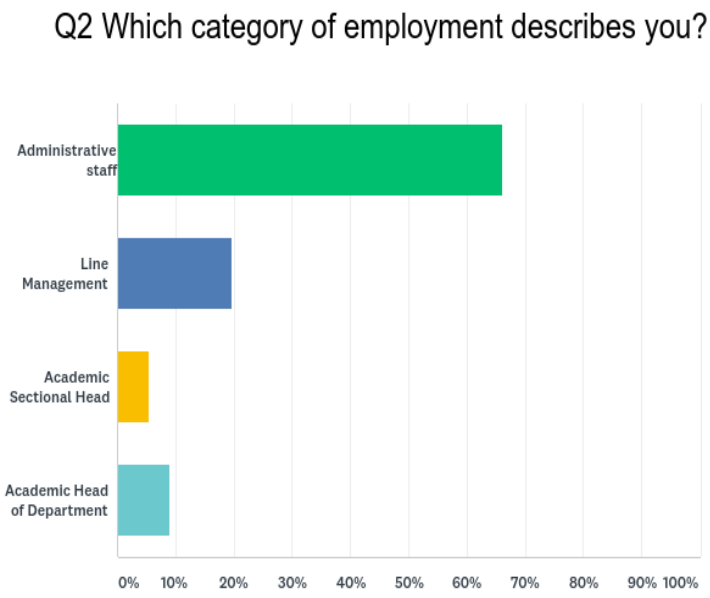


Figure 4.2: Category of employment

4.4 DATA PRESENTATION

4.4.1 The responsibilities of staff who interact with students or who make decisions that influence student experiences.

When trying to establish whether staff, as part of their responsibilities, make decisions that influence student experiences and interact with students, 52 responses were Yes (92.86%) while four respondents (7.14%) said No, as shown in the figure below. This shows that most staff members interact with students or make decisions that influence students' experiences.

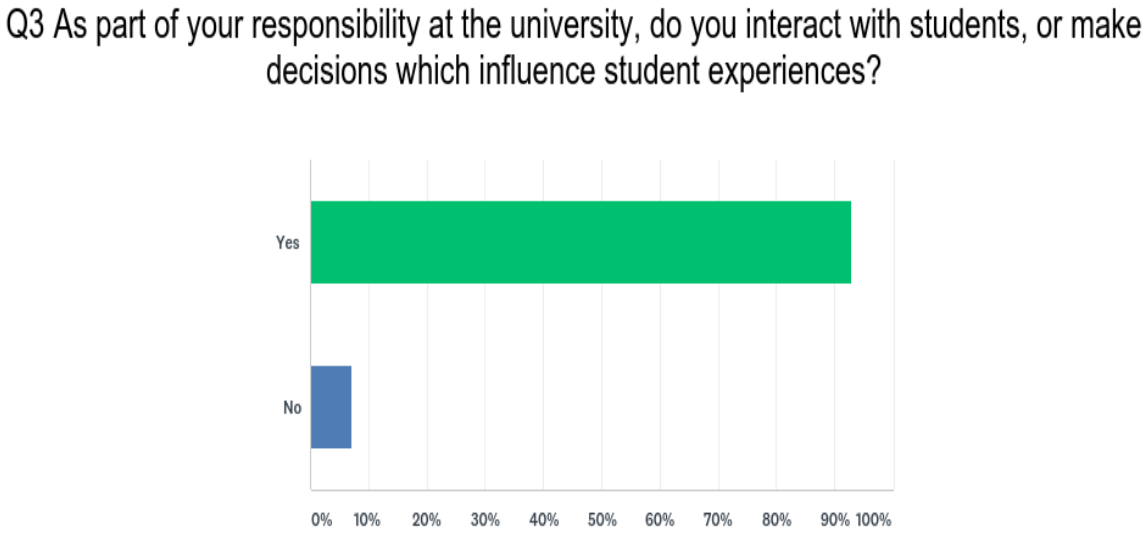


Figure 4.3: Responses on staff interaction with students

4.4.2 South African Sign Language as a recognised language in South Africa

The researcher was also trying to check if university staff are aware that South African Language (SASL) is recognised in South Africa. The responses were 53 (94.64%) Yes, while 3 (5.36%) said No, as indicated in the figure 4.4 below. The responses received show that most staff members know that SASL is recognised as a language in South Africa.

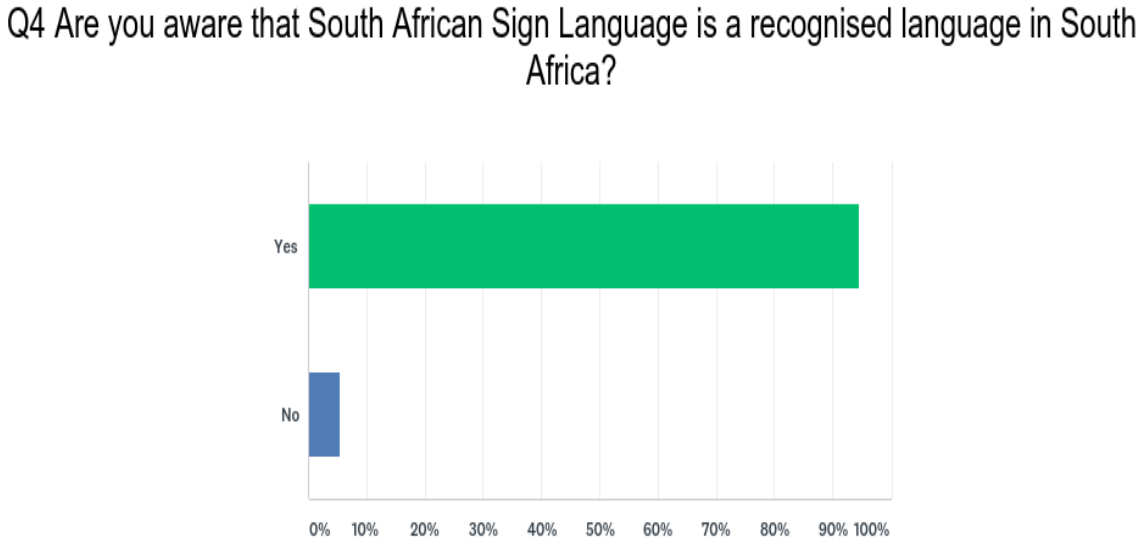


Figure 4.4: Awareness of SASL recognition

4.4.3 Communication in South African Sign Language

The researcher wanted to know if university staff are able to communicate in South African Sign Language. Responses are 4 (7.14%) yes, while 52 (92.86%) said no as illustrated in the table below. The figure shows number of staff who are either able or unable to communicate in South African Sign Language.

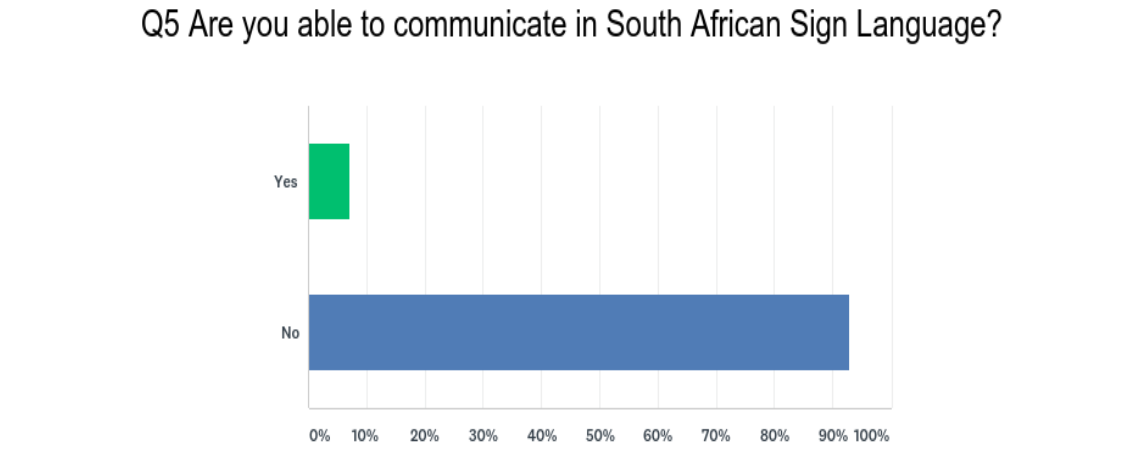


Figure 4.5: Staff who can or cannot communicate in SASL

4.4.4 Sign language learning by university staff

The researcher wanted to establish if communication between university staff and students with hearing impairments would improve if the staff learnt sign language. The responses were 52 respondents (92.86%) who said Yes, while four (7.14%) said No, as shown in the figure below.

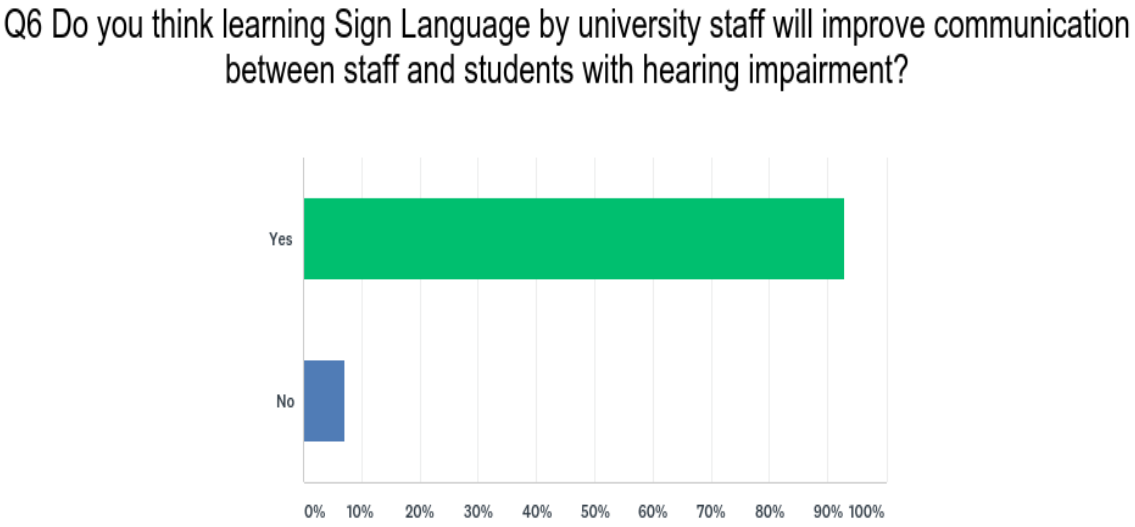


Figure 4.6: SL can improve communication

4.4.5 Policy on persons with disabilities

The researcher wanted to establish if university staff members know that the institution has a policy on persons with disabilities. The responses were 51 (91.07%) Yes, while six respondents (8.93%) said No. The number shows that most of the staff members who are supposed to implement the policy on persons with disabilities are aware of the existence of that policy.

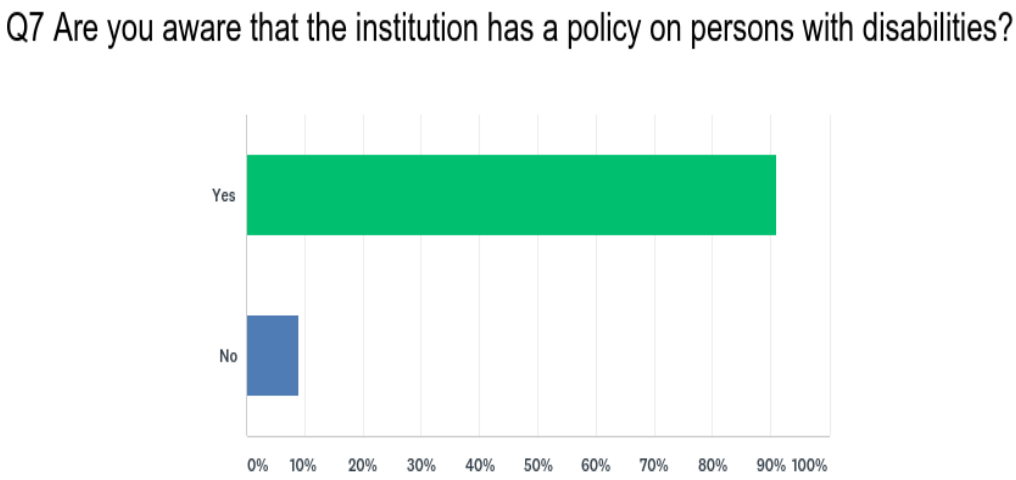


Figure 4.7: Policy on persons with disabilities

4.4.6 Experience with individuals with hearing impairments

The researcher also wanted to find out from the respondents if they have had any experience with individuals with hearing impairments. The responses were 23 (41.07%) Yes, while 33 (58.93%) said No, as illustrated in the figure below.

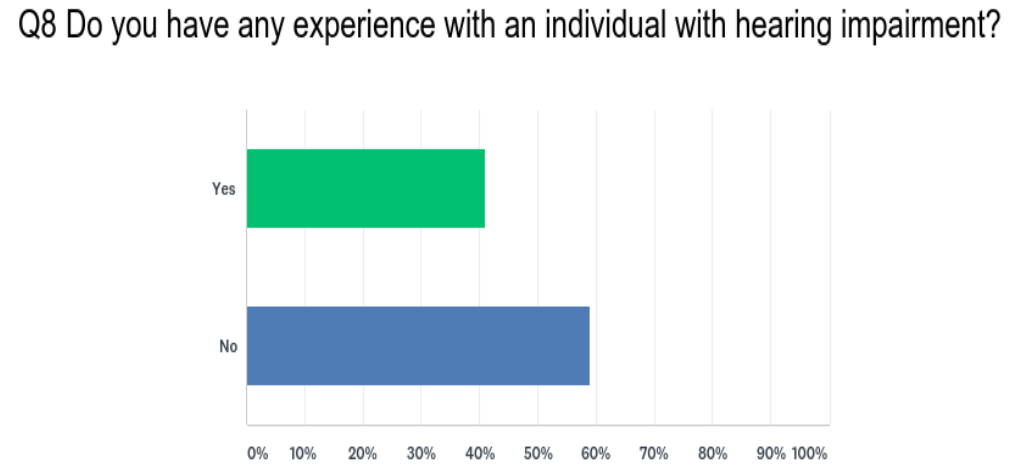


Figure 4.8: Staff experience with individual with hearing impairment

The researcher gave the respondents five options for answering the question below from which they had to select one option, as indicated below. In this way, the researcher wanted to determine the university's degree of readiness for admitting students with hearing impairments.

Key

	Strongly disagree
	Disagree
	Undecided
	Agree
	Strongly agree

4.4.7 Awareness campaigns for persons with disabilities

The researcher was interested in knowing whether the institution should be organising awareness campaigns for increasing awareness of persons with disabilities, especially of those with hearing impairments. The following responses were made: Eight respondents (14.29%) strongly disagreed, no respondents (0%) disagreed, three respondents (5.36%) were undecided, 18 (32.14%) agreed, and 27 (48.21%) strongly agreed.

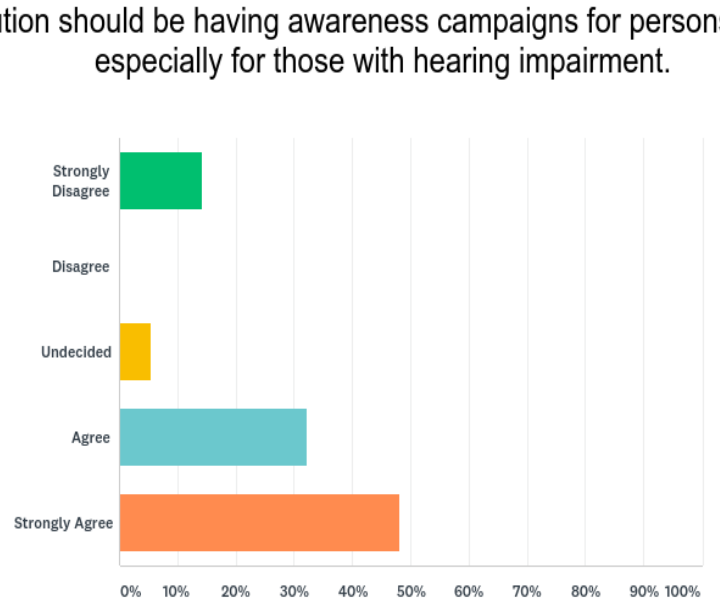


Figure 4.9: Campaigns for raising awareness of persons with disabilities

The objective of the study is to determine the barriers to the implementation of policies on access to institutions of higher learning by students with hearing impairments, so as to inform frameworks that will increase access for potential students with this special need. The two questions below focused on obtaining responses from respondents about policy implementation

4.4.8 Implementation of policy on persons with disabilities

The researcher also wanted to establish if the institution is able to maximally implement the policy on persons with disabilities. Seven respondents (12.50%) strongly disagreed, seven (12.50%) disagreed, 13 (23.21%) were undecided, 20 (35.71%) agreed, and nine (16.07%) strongly agreed.

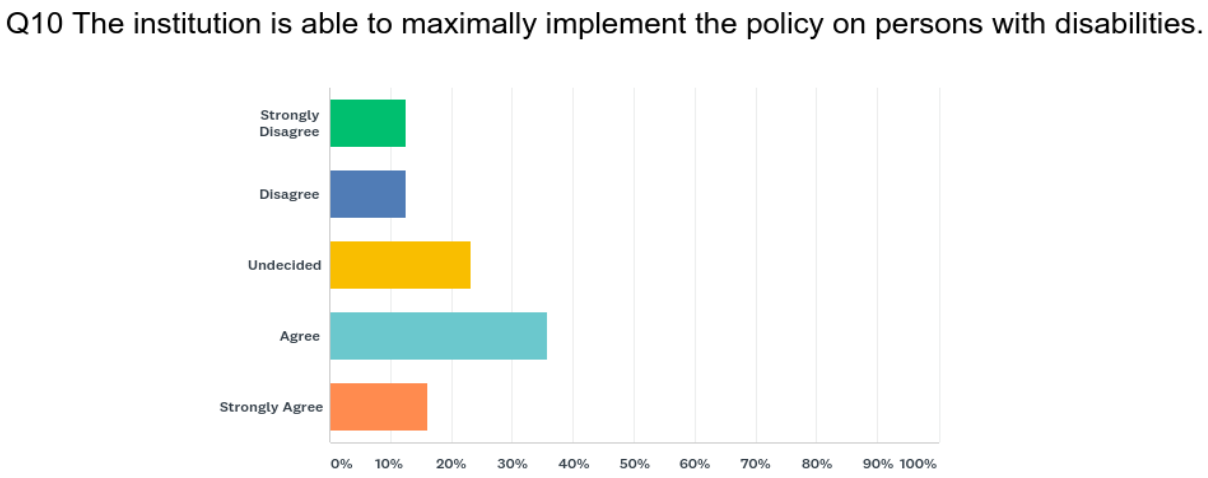


Figure 4.10: Implementation of policy on persons with disabilities

4.4.9 Barriers to the implementation of the policy

The researcher also requested the respondents to disagree or agree with the statement that there are barriers to the implementation of the policy on persons with disabilities. The responses are shown in the figure below and are as follows: Five respondents (8.93%) strongly disagreed, six (10.71%) disagreed, 14 (25%) were undecided, 26 (44.64%) agreed, and six (10.71%) strongly agreed.

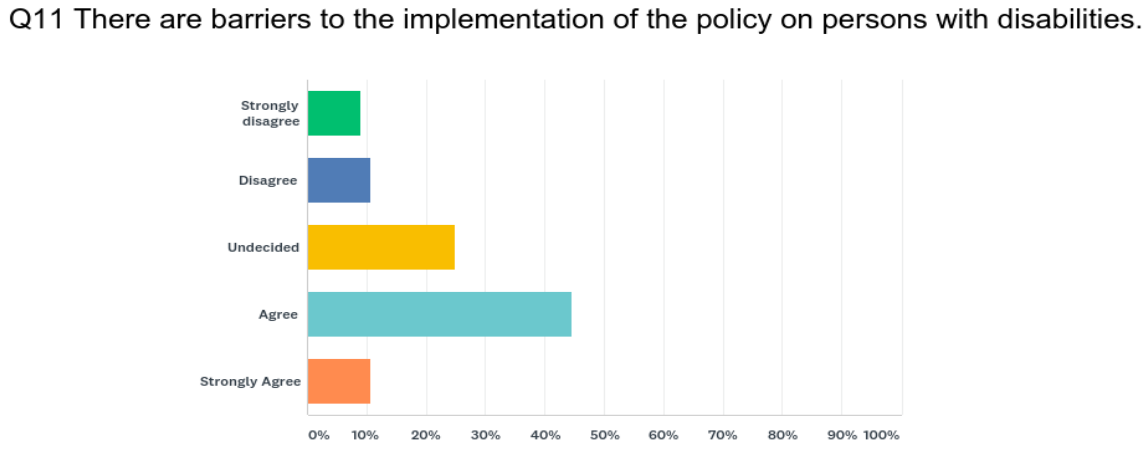


Figure 4.11: Barriers to implementation of policy

The second objective of the study was to assess the university's readiness to enrol students with hearing impairments, and to establish whether there is adequate support for students with hearing

impairments to experience a successful academic career. The last three statements observed the responses by participants to the study.

4.4.10 Inclusiveness of the institution

The respondents were requested also to respond to the statement on whether the institution in its current form is inclusive of students with hearing impairments or not, and the responses were as follows: Eight respondents (14.55%) strongly disagreed, 12 (21.82%) disagreed, 11 (20.00%) were undecided, 12 (38.18%) agreed, and three (5.45%) strongly agreed.

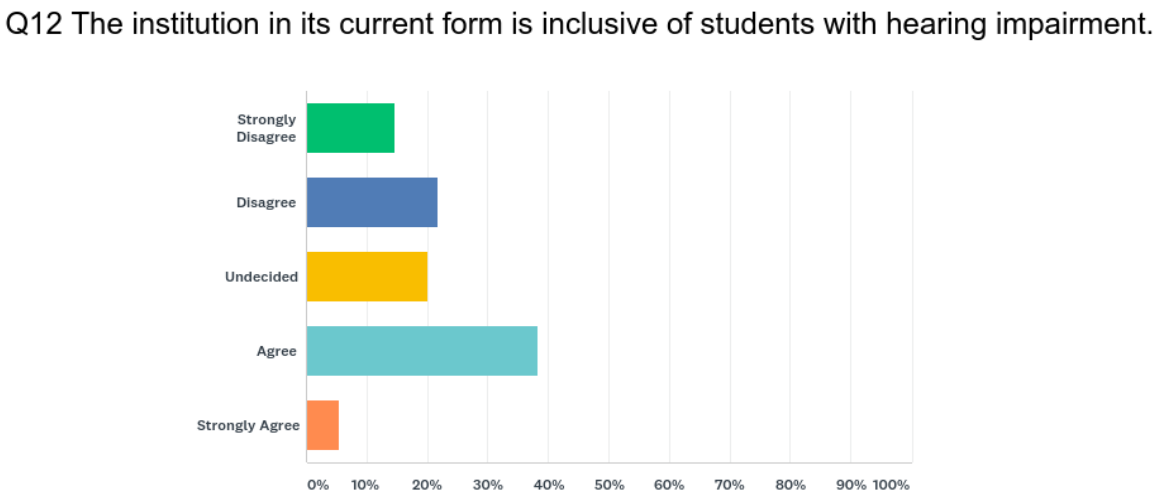


Figure 4.12: Inclusiveness of the institution

4.4.11 The readiness of the institution to accommodate students

The researcher also requested the respondents to disagree or agree with the statement that the institution is ready to accommodate students with hearing impairments. The responses were as follows: Nine respondents (16.07%) strongly disagreed, 23 (41.07%) disagreed, seven (12.50%) were undecided, 14 (25.00%) agreed, and three (5.36%) strongly agreed.

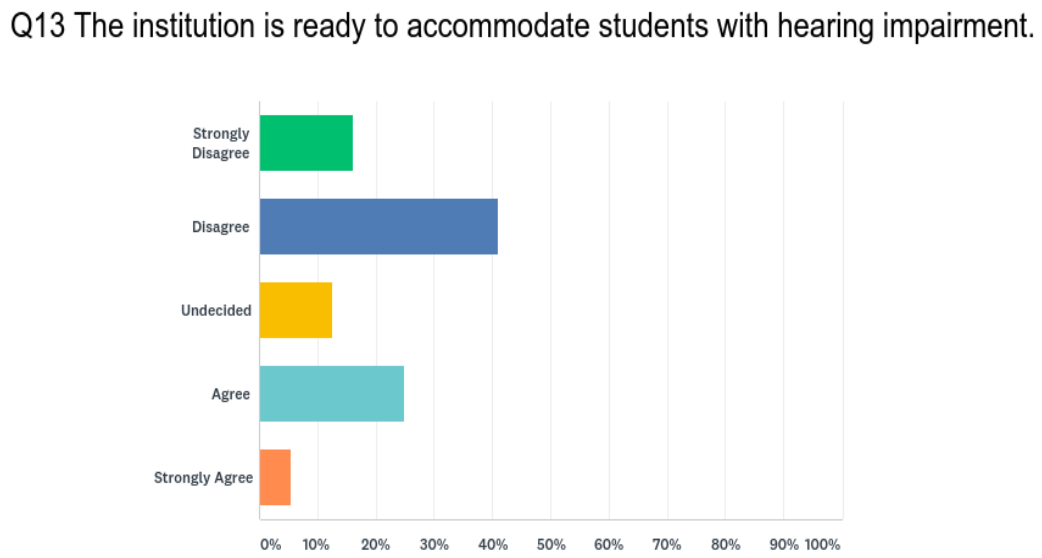


Figure 4.13: Institution readiness to accommodate students

4.4.12 Support structures/resources in place

The respondents were also requested to react to the statement that the institution has the support structures/resources in place to cater for students with hearing impairments, and the responses were as follows: Nine respondents (16.07%) strongly disagreed, 23 (41.07%) disagreed, nine (16.07%) were undecided, 13 (23.21%) agreed, and two (3.57%) strongly disagreed.

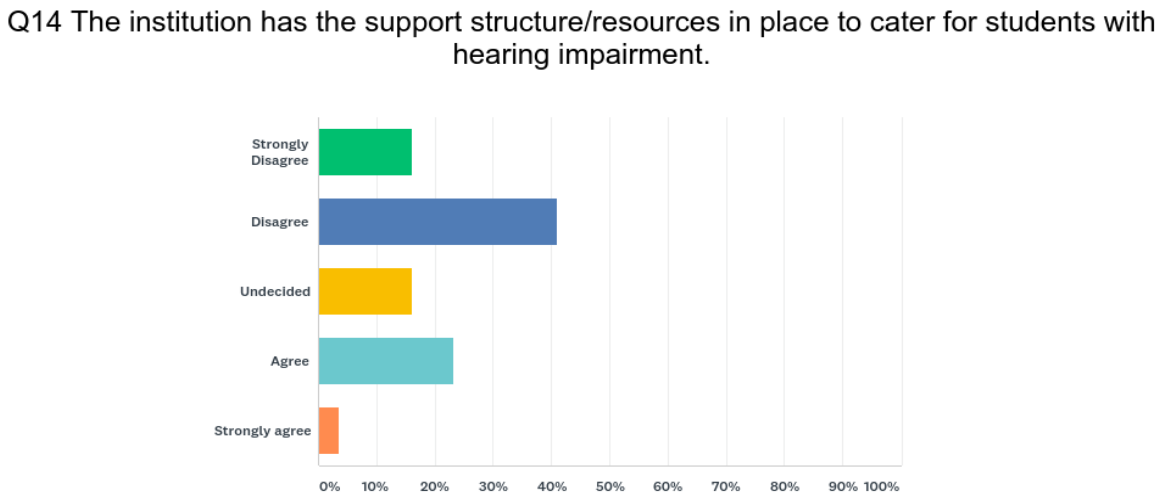


Figure 4.14: Support structures/resources

Comparisons of results using Fischer's exact test

Fischer's exact test measures the relationship between two variables and can be applied where the sample of two or more cells or when more 20% of the cells are less than 5, according to Kim (2017:152) Fisher's exact test is valid for all sample sizes but is usually used in the analysis of small samples. A significant relationship between two variables is observed when the p-value is less than 0.05.

Which university division do you function under?	As part of your responsibility at the university, do you interact with students, Yes	No	Total
Academic department	17	0	17
	100.00	0.00	100.00
Information services	6	0	6
	100.00	0.00	100.00
Registrar's environ..	29	4	33
	87.88	12.12	100.00
Total	52	4	56
	92.86	7.14	100.00

Fisher's exact = 0.405

Interpretation

The table above represents the comparisons between (a) in which university division do staff members function and (b) which respondents (staff members) interact with students as part of their responsibilities at the university, where Fischer's exact test is used to measure the relationship between these two variables. All 17 respondents who functioned under an academic department said they did interact with university students as part of their responsibilities. Also, all six information services respondents interacted with students, while four respondents from the registrar's environment did not interact with students. No significant relationships between the university division where respondents function and respondents who interacted with students as part of their university responsibilities were observed, because p-value is equal to 0.405, which is greater than 0.05.

Which university division do you function under?	Are you aware that South African Sign Language is a recognised language in South Yes	No	Total
Academic department	15	2	17
	88.24	11.76	100.00
Information services	6	0	6
	100.00	0.00	100.00
Registrar's environ..	32	1	33
	96.97	3.03	100.00
Total	53	3	56
	94.64	5.36	100.00

Fisher's exact = 0.479

Which university division do you function under?	Are you able to communicate in South African Sign Language? Yes	No	Total
Academic department	1	16	17
	5.88	94.12	100.00
Information services	1	5	6
	16.67	83.33	100.00
Registrar's environ..	2	31	33
	6.06	93.94	100.00
Total	4	52	56
	7.14	92.86	100.00

Fisher's exact = 0.552

Which university division do you function under?	Do you think learning Sign Language by university staff will improve communication Yes	No	Total
Academic department	16	1	17
	94.12	5.88	100.00
Information services	6	0	6
	100.00	0.00	100.00
Registrar's environ..	30	3	33
	90.91	9.09	100.00
Total	52	4	56
	92.86	7.14	100.00

Fisher's exact = 1.000

Which university division do you function under?	Are you aware that the institution has a policy on persons with disabilities? Yes	No	Total
Academic department	15	2	17
	88.24	11.76	100.00
Information services	6	0	6
	100.00	0.00	100.00
Registrar's environ..	30	3	33
	90.91	9.09	100.00
Total	51	5	56
	91.07	8.93	100.00

Fisher's exact = 1.000

Which university division do you function under?	Do you have any experience with an individual with hearing impairment? Yes	No	Total
Academic department	6	11	17
	35.29	64.71	100.00
Information services	3	3	6
	50.00	50.00	100.00
Registrar's environ..	14	19	33
	42.42	57.58	100.00
Total	23	33	56
	41.07	58.93	100.00

Fisher's exact = 0.788

Which university division do you function under?	The institution should be having awareness campaigns for persons with disability Strongly	Undecided	Agree	Strongly	Total
Academic department	2	0	6	9	17
	11.76	0.00	35.29	52.94	100.00
Information services	2	0	2	2	6
	33.33	0.00	33.33	33.33	100.00
Registrar's environ..	4	3	10	16	33
	12.12	9.09	30.30	48.48	100.00
Total	8	3	18	27	56
	14.29	5.36	32.14	48.21	100.00

Fisher's exact = 0.741

Which university division do you function under?	The institution is able to maximally implement the policy on persons with disability					
	Strongly	Disagree	Undecided	Agree	Strongly	Total
Academic department	2	4	4	5	2	17
	11.76	23.53	23.53	29.41	11.76	100.00
Information services	2	0	0	2	2	6
	33.33	0.00	0.00	33.33	33.33	100.00
Registrar's environ..	3	3	9	13	5	33
	9.09	9.09	27.27	39.39	15.15	100.00
Total	7	7	13	20	9	56
	12.50	12.50	23.21	35.71	16.07	100.00

Fisher's exact = 0.449

Which university division do you function under?	There are barriers to the implementation of the policy on persons with disability					
	Strongly	Disagree	Undecided	Agree	Strongly	Total
Academic department	2	1	5	8	1	17
	11.76	5.88	29.41	47.06	5.88	100.00
Information services	2	1	0	2	1	6
	33.33	16.67	0.00	33.33	16.67	100.00
Registrar's environ..	1	4	9	15	4	33
	3.03	12.12	27.27	45.45	12.12	100.00
Total	5	6	14	25	6	56
	8.93	10.71	25.00	44.64	10.71	100.00

Fisher's exact = 0.342

Which university division do you function under?	The institution in its current form is inclusive of students with hearing impair					
	Strongly	Disagree	Undecided	Agree	Strongly	Total
Academic department	7	3	0	7	0	17
	41.18	17.65	0.00	41.18	0.00	100.00
Information services	1	2	0	1	1	5
	20.00	40.00	0.00	20.00	20.00	100.00
Registrar's environ..	0	7	11	13	2	33
	0.00	21.21	33.33	39.39	6.06	100.00
Total	8	12	11	21	3	55
	14.55	21.82	20.00	38.18	5.45	100.00

Fisher's exact = 0.000

Which university division do you function under?	The institution is ready to accommodate students with hearing impairment.					
	Strongly	Disagree	Undecided	Agree	Strongly	Total
Academic department	5	7	1	4	0	17
	29.41	41.18	5.88	23.53	0.00	100.00
Information services	0	2	0	3	1	6
	0.00	33.33	0.00	50.00	16.67	100.00
Registrar's environ..	4	14	6	7	2	33
	12.12	42.42	18.18	21.21	6.06	100.00
Total	9	23	7	14	3	56
	16.07	41.07	12.50	25.00	5.36	100.00

Fisher's exact = 0.376

Which university division do you function under?	The institution has the support structure/resources in place to cater for students with hearing impairment					
	Strongly	Disagree	Undecided	Agree	Strongly	Total
Academic department	0	5	3	3	6	17
	0.00	29.41	17.65	17.65	35.29	100.00
Information services	1	2	0	3	0	6
	16.67	33.33	0.00	50.00	0.00	100.00
Registrar's environ..	1	16	6	7	3	33
	3.03	48.48	18.18	21.21	9.09	100.00
Total	2	23	9	13	9	56
	3.57	41.07	16.07	23.21	16.07	100.00

Fisher's exact = 0.128

Which category of employment describes you?	As part of your responsibility at the university, do you interact with students,	
	Yes	No	Total
Academic Head of De..	5	0	5
	100.00	0.00	100.00
Academic Sectional ..	3	0	3
	100.00	0.00	100.00
Administrative staff	33	4	37
	89.19	10.81	100.00
Line Management	11	0	11
	100.00	0.00	100.00
Total	52	4	56
	92.86	7.14	100.00

Fisher's exact = 0.767

Which category of employment describes you?	Are you aware that South African Sign Language is a recognised language in South Yes	No	Total
Academic Head of De..	4	1	5
	80.00	20.00	100.00
Academic Sectional ..	3	0	3
	100.00	0.00	100.00
Administrative staff	35	2	37
	94.59	5.41	100.00
Line Management	11	0	11
	100.00	0.00	100.00
Total	53	3	56
	94.64	5.36	100.00

Fisher's exact = 0.455

Which category of employment describes you?	Are you able to communicate in South African Sign Language? Yes	No	Total
Academic Head of De..	1	4	5
	20.00	80.00	100.00
Academic Sectional ..	0	3	3
	0.00	100.00	100.00
Administrative staff	3	34	37
	8.11	91.89	100.00
Line Management	0	11	11
	0.00	100.00	100.00
Total	4	52	56
	7.14	92.86	100.00

Fisher's exact = 0.587

Which category of employment describes you?	Do you think learning Sign Language by university staff will improve communication Yes	No	Total
Academic Head of De..	4	1	5
	80.00	20.00	100.00
Academic Sectional ..	3	0	3
	100.00	0.00	100.00
Administrative staff	35	2	37
	94.59	5.41	100.00
Line Management	10	1	11
	90.91	9.09	100.00
Total	52	4	56
	92.86	7.14	100.00

Fisher's exact = 0.482

Which category of employment describes you?	Are you aware that the institution has a policy on persons with disabilities? Yes	No	Total
Academic Head of De..	5	0	5
	100.00	0.00	100.00
Academic Sectional ..	2	1	3
	66.67	33.33	100.00
Administrative staff	34	3	37
	91.89	8.11	100.00
Line Management	10	1	11
	90.91	9.09	100.00
Total	51	5	56
	91.07	8.93	100.00

Fisher's exact = 0.385

Which category of employment describes you?	Do you have any experience with an individual with hearing impairment? Yes	No	Total
Academic Head of De..	2	3	5
	40.00	60.00	100.00
Academic Sectional ..	0	3	3
	0.00	100.00	100.00
Administrative staff	17	20	37
	45.95	54.05	100.00
Line Management	4	7	11
	36.36	63.64	100.00
Total	23	33	56
	41.07	58.93	100.00

Fisher's exact = 0.563

Which category of employment describes you?	The institution should be having awareness campaigns for persons with disability Strongly	Undecided	Agree	Strongly	Total
Academic Head of De..	1	0	2	2	5
	20.00	0.00	40.00	40.00	100.00
Academic Sectional ..	0	0	0	3	3
	0.00	0.00	0.00	100.00	100.00
Administrative staff	6	2	12	17	37
	16.22	5.41	32.43	45.95	100.00
Line Management	1	1	4	5	11
	9.09	9.09	36.36	45.45	100.00
Total	8	3	18	27	56
	14.29	5.36	32.14	48.21	100.00

Fisher's exact = 0.926

Which category of employment describes you?	The institution is able to maximally implement the policy on persons with disability					Total
	Strongly	Disagree	Undecided	Agree	Strongly	
Academic Head of De..	0	3	1	0	1	5
	0.00	60.00	20.00	0.00	20.00	100.00
Academic Sectional ..	1	1	0	1	0	3
	33.33	33.33	0.00	33.33	0.00	100.00
Administrative staff	5	1	10	15	6	37
	13.51	2.70	27.03	40.54	16.22	100.00
Line Management	1	2	2	4	2	11
	9.09	18.18	18.18	36.36	18.18	100.00
Total	7	7	13	20	9	56
	12.50	12.50	23.21	35.71	16.07	100.00

Fisher's exact = 0.066

Which category of employment describes you?	There are barriers to the implementation of the policy on persons with disability					Total
	Strongly	Disagree	Undecided	Agree	Strongly	
Academic Head of De..	0	0	1	4	0	5
	0.00	0.00	20.00	80.00	0.00	100.00
Academic Sectional ..	1	0	0	1	1	3
	33.33	0.00	0.00	33.33	33.33	100.00
Administrative staff	3	3	10	16	5	37
	8.11	8.11	27.03	43.24	13.51	100.00
Line Management	1	3	3	4	0	11
	9.09	27.27	27.27	36.36	0.00	100.00
Total	5	6	14	25	6	56
	8.93	10.71	25.00	44.64	10.71	100.00

Fisher's exact = 0.507

Which category of employment describes you?	The institution in its current form is inclusive of students with hearing impair					Total
	Strongly	Disagree	Undecided	Agree	Strongly	
Academic Head of De..	2	1	0	2	0	5
	40.00	20.00	0.00	40.00	0.00	100.00
Academic Sectional ..	3	0	0	0	0	3
	100.00	0.00	0.00	0.00	0.00	100.00
Administrative staff	3	10	8	14	1	36
	8.33	27.78	22.22	38.89	2.78	100.00
Line Management	0	1	3	5	2	11
	0.00	9.09	27.27	45.45	18.18	100.00
Total	8	12	11	21	3	55
	14.55	21.82	20.00	38.18	5.45	100.00

Fisher's exact = 0.020

Interpretation

The table above indicates comparisons between 'which category of employment describes you?' and 'the institution in its current form is inclusive of students with hearing impairments'. Respondents agreed that the institution in its current form is inclusive of students with hearing impairments, equal number of academic heads strongly disagreed and agreed that the institution in its current form is inclusive of students with hearing impairments, with a percentage value of 40% (2) respectively. While one out five (20%) academic heads disagreed that, the institution in its current form is inclusive of students with hearing impairments. Five out of 11 line managers agreed with the statement the institution in its current form is inclusive of students with hearing impairments. Significant relationship were observed with the two variable p-value (0.020) was less than 0.05.

Which category of employment describes you?	The institution is ready to accommodate students with hearing impairment. Strongly	Disagree	Undecided	Agree	Strongly	Total
Academic Head of De..	1	3	0	1	0	5
	20.00	60.00	0.00	20.00	0.00	100.00
Academic Sectional ..	2	1	0	0	0	3
	66.67	33.33	0.00	0.00	0.00	100.00
Administrative staff	5	16	5	9	2	37
	13.51	43.24	13.51	24.32	5.41	100.00
Line Management	1	3	2	4	1	11
	9.09	27.27	18.18	36.36	9.09	100.00
Total	9	23	7	14	3	56
	16.07	41.07	12.50	25.00	5.36	100.00

Fisher's exact = 0.777

Which category of employment describes you?	The institution has the support structure/resources in place to cater for students					
	Strongly	Disagree	Undecided	Agree	Strongly	Total
Academic Head of De..	0	1	1	1	2	5
	0.00	20.00	20.00	20.00	40.00	100.00
Academic Sectional ..	0	1	0	0	2	3
	0.00	33.33	0.00	0.00	66.67	100.00
Administrative staff	1	17	6	9	4	37
	2.70	45.95	16.22	24.32	10.81	100.00
Line Management	1	4	2	3	1	11
	9.09	36.36	18.18	27.27	9.09	100.00
Total	2	23	9	13	9	56
	3.57	41.07	16.07	23.21	16.07	100.00

Fisher's exact = 0.553

Reliability of the instrument specifically including all the Likert scale items was measured using Cronbach's alpha. Cronbach's alpha was used to measure the internal consistency of items. Reliability was accepted when the alpha test scale score was 0.70 and above.

Table AAA

Test scale = mean(standardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem correlation	alpha
Whichunive~2	56	+	0.3809	0.2097	0.0886	0.5583
Whichcateg~2	56	+	0.3358	0.1606	0.0917	0.5677
Aspartofyo~2	56	-	0.6036	0.4670	0.0730	0.5057
Areyouawa~n2	56	+	0.2362	0.0551	0.0987	0.5875
Areyouable~2	56	-	0.2975	0.1195	0.0944	0.5754
Doyouthink~2	56	-	0.2259	0.0445	0.0995	0.5896
Areyouawa~i2	56	-	0.3496	0.1756	0.0908	0.5650
Doyouhavea~2	56	-	0.3164	0.1394	0.0930	0.5715
Theinstit~g2	56	+	0.4205	0.2535	0.0859	0.5498
Theinstit~m2	56	+	0.4032	0.2343	0.0871	0.5536
Thereareba~2	56	+	0.5383	0.3889	0.0776	0.5223
Theinstit~f2	55	+	0.4740	0.3142	0.0822	0.5379
Theinstit~o2	56	+	0.4521	0.2892	0.0836	0.5427
Theinstit~t2	56	+	0.4459	0.2820	0.0841	0.5441
Test scale					0.0879	0.5742

Interpretation

Table AAA represent the Cronbach's Alpha score of the whole instrument and alpha scores by each items. Overall test scale alpha score was equal to 0.5742. All the items alpha scores ranged between 0.5715 to 0.5057. Reliability was not acceptable because the overall test scale alpha score was below 0.70.

4.5 SUMMARY

The chapter presented the findings of the study. The findings presented were obtained from the data collected using a questionnaire, and no other methods were used to collect data as the study only applied a quantitative approach. The purpose was to augment the statistical data displayed by figures from the quantitative report of the questionnaire. The presented data was based on the objectives of the study.

Hearing impaired students experience various challenges relating to lectures, to assessments and to assistance from staff or tutors. Challenges also include accessibility of financial aid and general information, lack of communication, and lack or resources. The study highlighted gaps in the system that need to be addressed.

UoT policy makers need to acknowledge the challenges faced by students with hearing impairments and transform these into more pleasant and accessible environments. By addressing these challenges, the system will accommodate the needs of students with hearing impairments and all students with disabilities. The next chapter will look at the conclusions and the recommendations.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY

5.1 INTRODUCTION

The preceding chapter presented the interpretation of the research findings, which were collected using a questionnaire. The findings were presented in such a way that they are easily understandable by the readers, in accordance with the objectives of the study. In this chapter, the researcher will be focusing on the summary of the data received, conclusions, and recommendations of the study. The researcher summarises previous chapters, which will shed light on what transpired in each of those chapters. The researcher also discusses recommendations that could assist the institution in improving future access for hearing-impaired students. The previous chapters highlighted the challenges, policy framework, and resources, which various authors emphasised in the literature review in Chapter Two.

5.2 SUMMARY OF THE FINDINGS OF THE STUDY

The findings of the study are summarised in this section in line with the objectives of the study. The objectives of the study were outlined in Chapter One, and can be summarised as determining what the barriers are to the implementation of the relevant policies, to assess the university's readiness to accommodate students with hearing impairments, and to establish whether there are support structures in place to support students in their learning spaces.

5.3 CONCLUSIONS OF THE STUDY BASED ON THE FINDINGS

The findings showed that 52 (92.86%) of respondents could not communicate using sign language. That on its own is a barrier to the implementation of a policy on persons with disabilities. It means that neither academic staff nor support staff at the university are able to communicate efficiently and effectively with students with hearing impairments. Moreover, this group of staff is supposed to be the implementers of the policy, yet, if they are unable to communicate using sign language, it will be a challenge to implement the policy successfully. The ability to communicate in sign language is a primary requirement for the implementation of the policy.

A total of 51 (91.07%) respondents are aware of the policy on persons with disabilities, and that is regarded as a positive start. Even though there are only 23 (41.07%) respondents who have experience with individuals with hearing impairments, the number can be increased by conducting workshops. The majority of respondents 18 (32.14%) agreed and 27 (48.21%) strongly agreed that workshops would be helpful.

Regarding the statement that the institution is maximally implementing the university policy, 20 respondents (35.71%) agreed and nine (16.07%) strongly agreed with the statement, while seven (12.50%) strongly disagreed and seven (12.50%) disagreed. Twenty-six respondents (44.64%) agreed and six (10.71%) strongly agreed that there were barriers in the implementation of the policy on persons with disabilities, which this study set out to determine. Thus, there were 32 (55.35%) confirming responses.

The responses to the statement that institution in its current form is inclusive of students with hearing impairments are noted next. The responses, as presented in the previous chapter, indicated

that that eight respondents (14.55%) strongly disagreed, 12 (21.82%) disagreed, and 11 (20%) were undecided, while 21 (38.18%) agreed and three (5.45%) strongly agreed. This shows that 36% of the respondents disagreed, 43.63% were in agreement, and 20% were undecided. Therefore, this study does not give a clear indication of whether the institution is inclusive of students with hearing impairments.

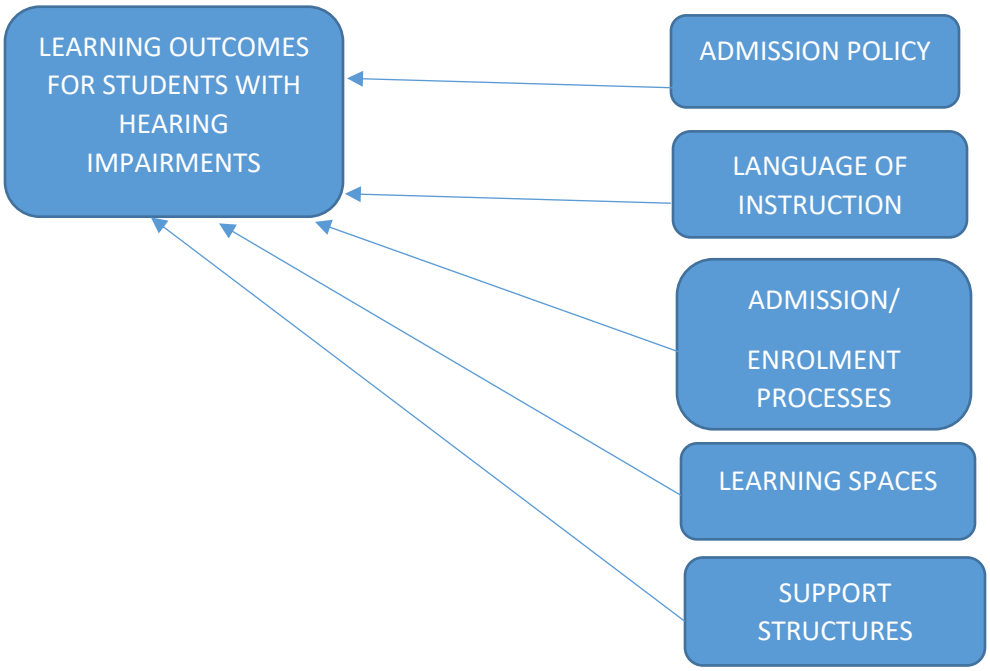
The responses to the statement that the institution is ready to accommodate students with hearing impairment showed that 32 respondents (57.14%) combined strongly disagreed and disagreed, while 17 respondents (30.36%) strongly agreed and agreed. Nine respondents (16.07%) were undecided. Based on the 32 respondents (57.14%) who disagreed, the conclusion is that the institution is not ready to accommodate students with hearing impairments.

The responses to the statement that the institution has support structures/resources in place to cater for students with hearing impairments showed that 32 (57.14%) respondents strongly disagreed and disagree with the statement, while 15 (26.78%) strongly agreed and agreed, and nine respondents (16.07%) were undecided. The study concluded that the institution does not have the necessary support structures/resources in place, based on the 57.14% of respondents who disagreed with the statement.

The theoretical framework below, discussed in detail in Chapter Two, determines the success or failure of the learning outcomes for hearing-impaired students. The success of students with hearing impairments depends on variables such as admission policy, language of instruction, admission and enrolment processes, learning spaces and support structures. Failure to have these variables in place means students with hearing impairments will be adversely affected and will not

be able to succeed in their learning journeys. This was developed in line with the objectives of the study.

DEPENDENT VARIABLES **INDEPENDENT VARIABLES**



5.4 RECOMMENDATIONS

The research responses indicate that university staff members are aware of the university's policy on persons with disabilities, but that more should still be done in terms of awareness campaigns for persons with disabilities, especially students with hearing impairments. The reduction of the barriers to the implementation of the policy, increased support, and improvements to the infrastructure would assist in ensuring that students with hearing impairments succeed academically. The policy on persons with disabilities is not only a framework of the UoT but also a policy of government of the Republic of South Africa. Failing to implement the policy, in terms of compliance to regulations, may result in government sanctioning the UoT to account.

5.4.1 Improving communication

Sign language workshops for staff are also important, as such workshops would contribute between hearing staff and students with hearing impairments. Communication is one of the biggest barriers in terms of access because many of the staff who are supposed to be implementers of the policy on persons with disabilities are unable to communicate using sign language. The institution can collaborate with the Pan South African Language Board (PanSALB) to ensure that it obtains good, qualified sign language interpreters.

5.4.2 Recruitment and admission processes

Inclusive recruitment and admission processes would assist in improving access for students with hearing impairment. The institution could broaden its recruitment scope by collaborating with special schools in the country as part of community development. If the university should showcase itself at special schools, learners at secondary schools would be motivated and they would become interested in enrolling at the institution. Exhibitions would also help to prepare learners for the courses they wish to pursue, and, at the same time, the institutions would know beforehand which courses those learners are interested in.

5.4.3 Induction of support and academic staff on how to deal with students with special needs

Induction for support and academic staff would make them aware of how to provide support to students with hearing impairments on campus during their academic years. Awareness campaigns for support and academic staff would improve their perceptions of and attitudes towards persons with disabilities, and especially students with hearing impairments. Knowledge and awareness of how to handle students with hearing impairments would have a positive effect on the process of accommodating them. University teachers must be encouraged to attend disability-related professional development courses.

5.4.4 Teaching and learning resources

The institution needs to ensure that infrastructure such as lecture halls are user-friendly for students with hearing impairments, and that noise levels are drastically reduced in venues. Students with hearing impairments cannot function properly in an environment where the noise level is high. The appointment of qualified sign language interpreters is crucial in ensuring that students with hearing impairments succeed during their academic years at the institution. It is also important to have special venues for writing tests and examinations, as students need to be accompanied by interpreters. Further research on new technological assistive devices that can be used in lecture halls to support both staff and students with hearing impairments is necessary. The university needs to benchmark with the two universities currently accommodating students with hearing impairments to see how those institutions designed their learning spaces like lecture halls, libraries and electronic resource centres.

5.4.5 Limitation of the study

The study was limited to one university of technology. Due to the fact that the study was only focused on one UoT, further studies can be extended to other UoTs and traditional universities in the country. The outcome of the study does not conclude that other universities in South Africa are confronted with the same challenges. The current study was limited to quantitative research and the information provided a personal perspective of staff who participated in the study. Only staff from Registrar's environment, departmental administrators and academic staff participated in the study. The outcome of the study does not include the views of staff in another divisions within the university.

5.4.6 Recommendation for future research

The following recommendations are made from the study:

- A further study which will cover more divisions within the university staff will shed more light on the overall readiness of the university
- Further studies could be carry out to discover the attitudes of able-bodied students towards persons with hearing impairments
- Studies of the same phenomenon can be conducted at other universities in South Africa
- Further studies can be conducted regarding the best possible ways on training sign-language interpreters
- Further studies could focus on an investigation into new technologies that will assist in developing assistive devices suitable for academic purposes in institutional learning spaces.

5.4.7 Conclusion

Learning spaces such as lecture halls, libraries and electronic resources centres play a critical role in the academic success of students with hearing impairments. The university needs to ensure that these learning spaces are easily accessible and are user-friendly for all students. The findings of the study confirm that there are barriers that the university needs to address in order to be more accessible to and accepting of students with hearing impairments. During the research process, the researcher became aware of the lack of knowledge regarding students with hearing impairments and these students' needs at a UoT.

5.5 LIST OF REFERENCES

ANTIA, S.D., JONES, P., LUCKNER, J., KREIMEYER, K.H. & REED, S. 2011. Social Outcomes of Students Who are Deaf and Hard of Hearing in General Education Classrooms. *Exceptional Children,* 77(4):489-504.

ANTIA, S.D., JONES, P.B., REED, S. & KREIMEYER, K.H. 2009. Academic Status and Progress of Deaf and Hard-of-Hearing Students in General Education Classrooms. *The Journal of Deaf Studies and Deaf Education,* 14(3):293-311.

BELL, D., CARL, A. & SWART, E. 2016. Students with hearing impairment at a South African university: Self-identity and disclosure. *African Journal of Disability,* 5(1):1-9.

BETTER HEARING INSTITUTE. 2018. *Degrees of hearing loss* [Online]. Available from: http://www.betterhearing.org/hearingpedia/types-hearing-loss [Accessed: 16/08/2018].

BINES, H. & LEI, P. 2011. Disability and education: The longest road to inclusion. *International Journal of Educational Development,* 31,(2011):419-424.

BLAIKIE, N. 2009. *Designing social research.* 2nd ed. Malden: Polity Press.

BLUMBERG, B., COOPER, D.R. & SCHINDLER, P.S. 2011. *Business Research Methods.* 3rd ed. Maidenhead: McGraw-Hill Education.

CLAIBORNE, L.B., CORNFORTH, S., GIBSON, A. & SMITH, A. 2011. Supporting students with impairments in higher education: social inclusion or cold comfort? *International Journal of Inclusive Education,* 15(5):513-527.

CRESWELL, J.W. 2014. *Research design, a qualitative, quantitative and mixed method approaches.* 4th ed. London: Sage Publication Inc.

CRESWELL, J.W. 2015. *A concise introduction to mixed methods research.* 1st ed. California: SAGE.

CURTIS, B. & CURTIS, C. 2011. *Social Research: A practical introduction.* 1st ed. London: SAGE.

DAVID, F.R. 2013. *Strategic management: concepts and cases.* 14th ed. Boston: Pearson.

DE BOER, A., PIJL, S.J. & MINNAERT, A. 2011. Regular primary schoolteachers' attitudes towards inclusive education: a review of the literature. *International Journal of Inclusive Education,* 15(3), 2011/04/01:331-353.

ECKES, S.E. & OCHOA, T.A. 2005. Students with Disabilities: Transitioning from High School to Higher Education. *American Secondary Education,* 33(3):6-20.

ENGELBRECHT, P. 2006. The implementation of inclusive education in South Africa after ten years of democracy. *European Journal of Psychology of Education,* 21(3):253-264.

FULLER, M., BRADLEY, A. & HEALEY, M. 2004. Incorporating disabled students within an inclusive higher education environment / L'intégration en milieu ordinaire des étudiants handicapés. *Disability and Society* 19(5):455-468.

GARG, A.J. 2016. *A functional approach to ressearch proposal writing for MBA and Doctoral studies.* 1st ed. New Delhi: Aster Educational Publishers Private Ltd.

GRADEMINERS. 2017. *The advantages and disadvantages of using questionnaires in research* [Online]. Available from: https://grademiners.com/free-papers/english/the-advantages-and-disadvantages-of-using-questionnaires-in-research [Accessed: 11/10/2018].

GUDYANGA, E., WADESANGO, N. & ELIPHANOS, N. 2014. Challenges faced by students with hearing impairment in Bulawayo Urban regular schools. *MCSER,* 5(9), May.:445-451.

HANAFIN, J., SHEVLIN, M., KENNY, M. & NEELA, E.M. 2007. Including young people with disabilities: Assessment challenges in higher education. *Higher Education,* 54(3):435-448.

HASSAN, Z.A., SCHATTNER, P. & MAZZA, D. 2006. Doing A Pilot Study: Why Is It Essential? *Malaysian family physician : the official journal of the Academy of Family Physicians of Malaysia,* 1(2-3):70-73.

HERNÁNDEZ, E. 2015. What Is 'Good' Research? Revealing the Paradigmatic Tensions in Quantitative Criticalist Work. *New Directions for Institutional Research,* 2014(163):93-101.

HOWELL, C. & LAZARUS, S. 2003. Access and participation for students with disabilities in South African higher education : challenging accepted truths and recognising new possibilities : research paper. *Perspectives in Education,* 21(3):59-74.

INVESTOR WORDS. 2018. *Definition of data analysis* [Online]. Available from: http://www.investorwords.com/19279/data_analysis.html [Accessed: 28/08/2018].

IZET, M. 2015. Ethics in research and publication of research articles. *South Eastern European Journal of Public Health,* 2(1):1-8.

KIM, H.-Y. 2017. Statistical notes for clinical researchers: Chi-squared test and Fisher's exact test. *Restorative dentistry & endodontics,* 42(2):152-155.

KOMESAROFF, L. 2005. Category politics: deaf students' inclusion in the 'hearing university'. *International Journal of Inclusive Education,* 9(4):389-403.

LEONARDI, M., BICKENBACH, J., USTUN, T.B., KOSTANJSEK, N. & CHATTERJI, S. 2006. The definition of disability: what is in a name? *The Lancet,* 368(9543), Oct.:1219-1221.

LOE, I.M. & FELDMAN, H.M. 2007. Academic and Educational Outcomes of Children With ADHD. *Journal of Pediatric Psychology,* 32(6):643-654.

MAGONGWA, L. 2010. Deaf Education in South Africa. *American Annals of the Deaf,* 155(4):493-496.

MANALO, E. & TRAFFORD, J. 2004. *What is literature review* [Online]. Available from: https://ltl.lincoln.ac.nz/research/writing-a-literature-review/what-is-a-literature-review/ [Accessed: 07/08/2018].

MATSHEDISHO, K.R. 2007. Access to higher education for disabled students in South Africa : a contradictory conjuncture of benevolence, rights and the social model of disability / Intégration scolaire des étudiants handicapés en Afrique du Sud : un mélange de bienveillance, de droits et de modèle social. *Disability & society (Online),* 22(7):685-699.

MAYAT, I. & AMOSUN, S.L. 2011. Perceptions of Academic Staff towards Accommodating Students with Disabilities in a Civil Engineering Undergraduate Program in a University in South Africa. *Post secondary Education and Disability,* 24(1):53-59.

MOLOI, K.C. & MOTAUNG, R.R. 2014. Admission of and Service Provision for Deaf Students at a University of Technology. *Mediterranean Journal of Social Sciences,* 5(10):370-371.

MUTANGA, O. 2017. STUDENTS WITH DISABILITIES' EXPERIENCE IN SOUTH AFRICAN HIGHER EDUCATION -- A SYNTHESIS OF LITERATURE. *South African Journal of Higher Education,* 31(1):135-154.

MUTANGA, O., MANYONGA, B. & NGUBANE-MOKIWA, S. 2018. *Higher education disability policy - Important but flawed* [Online]. Available from: http://www.universityworldnews.com/article.php?story=20180724113833368 [Accessed: 30/07/2018].

NEL, P., VAN DYK, P., HAASBROEK, G., SCHULTZ, H., SONO, T. & WERNER, A. 2004. *Human Resources Management.* 6th ed. Cape Town: Oxford University Press Southern Africa.

PEARCE, J.A. & ROBINSON, R.B. 2009. *Formulation, implementation & control of competitie strategy.* 11th ed. Boston: McGraw-Hill.

POLIT, D.F. & BECK, C.T. 2006. *Essentials of Nursing Research: Methods, Appraisal and Utilisation.* 6th ed. Philadelphia: Lippincott Williams & Wilkins.

PRACTICE, G.D. 2017. *Diversity & Inclusion* [Online]. Available from: http://www.globaldiversitypractice.co.uk/what-is-diversity-inclusion/ [Accessed: 06//08/2018].

PROWSE, S. 2009. Institutional construction of disabled students. *Journal of Higher Education Policy and Management,* 31(1), Feb.:89-96.

RAJAM, P.S. & BALAKRISHNAN, G. 2011. Real time Indian Sign Language Recognition System to aid deaf-dumb people. *Indian Journal of Otology,* 1(1):737-742.

RICHARDSON, J.T.E. 2010. The Representation and Attainment of Students with a Hearing Loss in Higher Education. *Studies in Higher Education,* 26(2):183-204.

RYAN, J. 2011. Access and Participation in Higher Education of Students with Disabilities: Access to What? *Australian Educational Researcher,* 38(1):73-93.

SALKIND, N.J. 2009. *Exploring Research.* 8th ed. New Jersey: Person Internal Edition.

SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2016. *Research Methods for Business Students.* Seventh Edition ed. England: Pearson Education.

SCHICK, B., WILLIAMS, K. & KUPERMINTZ, H. 2006. Look Who's Being Left Behind: Educational Interpreters and Access to Education for Deaf and Hard-of-Hearing Students. *Journal of Deaf Studies and Deaf Education*, 11(1):3-20.

SLACK, N., BRANDON-JONES, A. & JOHNSTON, R. 2013. *Operations Management.* 7th ed. Edinburgh Gate: Pearson Education.

SOUTH AFRICA. 1996. *Constitution of the Republic of South Africa* [Online]. Available from: http://www.wipo.int/edocs/lexdocs/laws/en/za/za107en.pdf [Accessed: 06/08/2018].

SOUTH AFRICA. Training, H.E.A. 2014. *Policy Framework on differentiation in the South African post-school system* [Online]. Available from: http://www.dhet.gov.za/Gazette/Policy%20Framework%20on%20Differentiation%20in%20the%20South%20African%20Post%20School%20System.pdf [Accessed: 07/08/2018].

SOUTH AFRICA. Department of Higher Education and Training. 2015a. *Public Universities in South Africa* [Online]. Available from: http://www.dhet.gov.za/SitePages/UniversityEducation.aspx [Accessed: 06/09/2018].

SOUTH AFRICA. Department of Social Development. 2015b. *White paper on the rights of persons with disabilities* [Online]. Available from: www.dsd.gov.za [Accessed: 06/08/2018].

STATISTICS SOUTH AFRICA. Statistics South Africa. 2011. *General Household survey: 2010* [Online]. Available from: http://www.statssa.gov.za/ [Accessed: 03/08/2018].

THOMPSON, A.A., STRICKLAND, A.J. & GAMBLE, J.E. 2010. *Crafting and executing strategy: concepts and cases.* 17th ed. Boston: McGraw-Hill.

TSHWANE UNIVERSITY OF TECHNOLOGY. 2018a. *Student Rules and Regulations* [Online]. Available from: https://www.tut.ac.za/ProspectusDocuments/2018/Chapter_29_2018.pdf [Accessed: 23/08/2018].

TSHWANE UNIVERSITY OF TECHNOLOGY. 2018b. *University Staff Portal* [Online]. Available from: https://jupiter.tut.ac.za/staffportal/index.php [Accessed: 20 March 2018 2018].

UNESCO. 2005. Better Edcuation for all. Public Document.

UNESCO. 2015. Education 2030 Icheon Declaration and Framework for Action. Public Document.

VARSHNEY, S. 2016. Deafness in India. *Indian Journal of Otology,* 22(2):73-76.

VICKERMAN, P. & BLUNDELL, M. 2010. Hearing the voices of disabled students in higher education. *Disability & Society*, 25(1):21-32.

WELMAN, C., KRUGER, F. & MITCHELL, B. 2005. *Research Methodology.* 3rd ed. Cape Town: Oxford University Press Southern Africa.

WISKER, G. 2007. *The post-graduate research handbook.* 2nd ed. New York: Macmillan.

WOODCOCK, K., ROHAN, M.J. & CAMPBELL, L. 2007. Equitable Representation of Deaf People in Mainstream Academia: Why Not? *Higher Education*, 53(3):359-379.