The impact of assistive devices on individuals with special visual needs and its ethical implications: exploring the experiences of students with special visual needs in University of KwaZulu-Natal, Pietermaritzburg campus.

by

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Declaration

I, Mgcini E. E. Sithole, declare that:

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Psalm 144:1-2.

> Praise be to the LORD my Rock, who trains my hands for war, my fingers for battle.
> He is my loving God and my fortress, my stronghold and my deliverer, my shield, in whom I take refuge, who subdues peoples

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Abbreviations

APL: Assistive Products List

CRPD: Convention on the Rights of Persons with Disabilities

CRC: Campus Representative Council

DASA: Differentially Abled Student Association

DSU: Disability Support Unit

EASTIN: European Assistive Technology Information Network

IDEA: individuals with Disabilities Education Act

IPG: Institutional Planning and Governance

JAWS: Job Access With Speech

KZN: Kwazulu-Natal

LAN: Local Area Network

NSFAS: National Student Financial Aid Scheme

NICHCY: National Dissemination Center for Children with Disabilities

NVDA: NonVisual Desktop Access

PMB: Pietermaritzburg

SANCB: South African National Council for the Blind

UKZN: University of KwaZulu-Natal

WITS: University of Witwatersrand

WHO: World Health Organisation

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Abstract

The development of assistive devices has resulted in a more promising society, particularly for people with special visual needs. The invention gives people with special visual needs more opportunities to study, be independent, and work. However, in this modern world, there are still some ethical considerations and implications for using assistive devices. Students with special visual needs face accommodation and adaptation challenges, limiting their full interaction with other students and community members. The aim of this study is to explore the experiences of students with special visual needs at the University of KwaZulu-Natal Pietermaritzburg campus with the use of assistive devices, and to assess the impact and ethical implications of these assistive devices. This study has used a qualitative research approach. In this study, semi-structured in-depth face-to-face and online interviews were conducted. The study includes 20 students with special visual needs at the University of KwaZulu-Natal Pietermaritzburg campus. In this study, I argue that poorly designed physical environments continue to create difficulties that continue to exclude people with special visual needs from participating in their societies. Students also face the challenge of high cost of necessary assistive devices, a lack of training, and being misunderstood by other members of the community. In order to sensitize non-special needs individuals, the University of KwaZulu-Natal must make campuses more accessible and friendly to all individuals with special visual needs. This includes raising awareness and ensuring that individuals with special visual needs participate fully in university life and beyond.

Key words: Assistive devices, special visual needs, ethical implications, accommodation needs

Chapter one

1.1 Introduction

Understanding various societal values and human behavior requires knowledge in the domains of ethics and disability studies. Understanding the different societal values show how people interact with one another, with animals, and with technology. According to Nind (2008:5), “investigating and comprehending the lives and challenges of individual with special visual needs is crucial when understanding the study of ethics”. The study of ethics involves a deep understanding and conviction based on inherent value of different societies. Additionally, ethics studies are crucial for comprehending and evaluating society. This is important for determining the ethical implications that apply to all forms of life. This includes those who have special needs and members of underrepresented communities. When analyzing individuals with special visual needs, ethics is the main point of focus in this study.

Ethics is the study based on the different values or morals, or beliefs on what is morally good and wrong. Ethics provides the framework for norms, which may then be utilized to comprehend existing standards. According to Gluchmanova (2015), to enable persons and organizations to handle the particular issues and opportunities presented by the digital era, preexisting ethical frameworks must be improved. This will help build a more understanding of the different challenges and opportunities. Disability study theory, according to Meekosha and Shuttleworth (2009); Vehmas and Watson (2014), includes a wide range of interdisciplinary methods based on the study of students with visual impairments. In this paper, the phrase "disability study theory" is used to refer to a wider spectrum of methodologies, including those that have their roots in the study of ethics. Schalk (2017) states that the theory demands a serious assessment of special needs and the societal norms that categorize traits as impairments.

Our ability to participate economically and socially has been impacted by the transition of the globe into a more advanced and digital era. The transition has an impact on all facets and spheres of life, but particularly on the lives of those with special needs in South Africa's educational system. The digital era includes assistive devices and artificial intelligence that impact the lives of students with visual impairments. However, some people are still left out because of the unavailability and high cost of assistive devices. With the use of assistive devices, there are various ways of ensuring accessibility of individuals with special needs to hitherto inaccessible

information. Students with special visual needs can improve their access to written works by using a screen reader like Open Book, Magic, Job Access with Speech (JAWS), or Zoom Text (which enlarges texts).

How people integrate into society and the economy has been altered by the development of assistive devices. This has a profound impact on everyone's ability to attend education especially those with special visual needs. Access to information in educational resources has improved for people with special visual needs due to assistive devices like text enlargement software and the use of screen-reading software to read online content. The use of assistive devices in education opens many chances for everyone to participate in lessons and courses (Burgstahler, 2015). Individuals with different special needs can be accommodated in an educational setting with the aid of assistive devices. According to Philpott and Muthukrishna (2019) the use of assistive devices is developing a setting that can increase access and foster networking and collaboration in educational settings.

This study makes the case that it is crucial to investigate the impact of assistive devices and experiences of students with visual needs. The aim of this research is to explore the effectiveness of assistive devices focusing on students with special visual needs on the University of Kwazulu-Natal Pietermaritzburg (UKZN PMB) campus. The research plays a role in creating awareness about the experiences of individuals with special visual needs which can play a role in creating an inclusive environment. This study also plays a significant role in clearly noting and narrating challenges of students with visual impairments. I argue that it is critical to comprehend the daily struggles that people with visual impairments go through, in order to understand and evaluate the difficulties. I maintain that understanding individuals with special visual needs allows a clear understanding of the social challenges while also placing the discussion within an ethical, normative framework.

According to Trohanis (2008:4) “a visual impairment is, even with treatment, severely impairs a learner’s educational performance”. This because the learner might be required to have more educational needs compared to other learners. Visual impairments can be caused by a variety of challenges, and they can manifest themselves in a variety of ways. This can include too much light or darkness or stress which can lead to increased eye pressure. According to Sheet (2010) the National Dissemination Center for Children with Disabilities (NICHCY) states that special visual needs include vision problems like near-sightedness and far-sightedness, as well as more difficult

issues like congenital cataracts and strabismus. Individuals with special visual needs can have special educational needs to overcome the barriers and hence the use of assistive devices is essential. If teaching was conducted in diverse ways, then individuals with special visual needs would be easily accommodated and achieve even greater accomplishments.

The term “special visual needs” is more appropriate in this study because it puts greater emphasis on the special requirements or limitations that the individual faces first. It also demonstrates that the person has unique needs but is not harmed or incapacitated by any ailment. In this dissertation, the term “individuals with special visual needs” is more appropriate than the term "disability", as it demonstrates that these people experience physical challenges or restrictions that lead them to require exceptional care. However, labels like "the crippled", "a person with a disability", and "disabled person" are demeaning and discriminatory. This chapter introduces the research and its significance in the fields of disability and ethics studies. The chapter also examines the study's background, justification, and problem statement. The chapter discovers the role of ethics in understanding the importance of assistive devices on individuals with special visual needs. It includes key issues and objectives, a theoretical understanding also including the methodology of the research.

1.2 Rationale and statement of the study

Although the development of technology and assistive technologies has significantly improved people's lives. It is important to take into consideration what are the different ethical implications that affect the provision of assistive devices to individuals with special visual needs (Atkinson & Castro 2008; Visagie et al., 2016). Given the kind of academic work that is required in tertiary institutions, assistive devices play an important role in ensuring that access to higher education is possible. Assistive devices also play a role in ensuring successful involvement in the economy and academic spaces as individuals with special needs were previously not accommodated.

According to Campbell (2009), the South African educational system has made it a priority to provide students with special needs with the required assistive technologies. Therefore, it has been possible to allow students to be included and properly accommodated in schools especially in the special needs education by using assistive devices and equipment. This has been crucial in fostering inclusiveness and granting those with special needs access to greater educational

opportunities. According to Rafferty, Boettcher, and Griffin (2001: 266) inclusion is "the process of educating individuals with special needs in regular education classrooms near their communities and using appropriate technology". For them to be successful as other individuals, it is crucial that people with special needs obtain and have access to appropriate technologies. According to Kasiram and Subrayen (2014), not having the appropriate assistive devices for individuals with special visual needs can have a detrimental impact on a person's development, well-being, and interpersonal interactions. To guarantee accessibility and availability, the government and various organizations need to work with groups and people with special needs in creating inclusion.

It is impossible to overstate the importance of assistive devices in education as a catalyst for increased knowledge and appropriate accommodations. The availability of assistive technology can be extremely important in fostering inclusion for people with special needs. It is impossible to overstate the importance of assistive devices in education as mechanisms for facilitating information access. Assistive devices have facilitated easier access to information in and out of the education system (Duplaga, 2017). Thus, assistive devices have proven to be a useful tool that, among other things, enables a range of individuals to access information online. Students have access to a variety of tools, including free open-source software like NonVisual Desktop Access (NVDA). Students with visual needs may find it easier to navigate online platforms with the help of assistive software. The online platforms can be used to attend classes and meetings.

My interest for this topic is motivated by personal life experiences and observations as a person with a special visual need within the Kwazulu-Natal (KZN) province. The experiences and observations have made me notice the importance of assistive tools for students who are visually impaired in the different communities I have been part of. From an early age, I attended a special school for learners with both special visual and hearing needs in Pietermaritzburg. Attending the school allowed me to meet learners with visual and hearing needs and share experiences that we go through in our different communities. Some of the devices that I was exposed to was the braille machine, talking watches, white canes, talking calculators and microwaves. These devices play a key role in ensuring that I can actively participate in social and academic spaces and be independent. These items include household and cooking devices, educational Aid, and mobility aid. The availability of these devices has been possible through companies and organisations such as Blind SA, Sensory Solutions, edit Microsystems and The South African Council for the Blind (SANCB).

It was sad to hear the different marginalization and lack of accommodation due to not having the necessary assistive devices from some of the learners I attended school. It was also sad to note that there are different assistive devices and technology that have been introduced internationally and locally after 1994 but some learners cannot access these devices or cannot use them. Thus, this is an ethical concern as they are deprived an opportunity to be properly accommodated in their societies and a system that seeks to take into consideration the rights of everyone. In addition, it has been also a serious concern for me that learners with special needs are not accommodated in spaces such as mainstream schools near their home or communities. This shows that there is still disparity with regards to accessing and benefiting from education and accommodation between learners with special needs and those without special needs. Assistive devices play a significant role in creating an environment that is suitable for the needs and lifestyle of learners with special needs. This is because these devices allow a suitable learning system and environment that is appropriate for their special differences.

In 2016, I joined the UKZN PMB campus. I was fortunate to be part of such a vast community of diverse groups from diverse backgrounds and levels of societies. Part of these groups were also students with special needs from different communities in different levels of studies. The greatest highlight was to see students with special needs included in such a huge environment and the interaction especially between students with special needs and the wider university community. At first, it was difficult to deal with the interaction and to adapt to the pristine environment. However, I realized that if the barriers were removed, a person with a visual impairment can achieve a lot and has great capacity. This made or allowed me to be interested on focusing on student with special needs' challenges and the importance of using assistive technology. It also made me to be interested on how technology is affecting individuals with special visual needs in adapting to their societies through the use of assistive devices. I aim to clearly understand the effect of assistive technology on individuals with special visual needs and its ethical implications. Through this, the research has allowed me to understand the accommodation needs that are neglected and challenges faced by individuals with special visual needs in UKZN or their communities.

When considering a suitable topic for my dissertation, I went through several studies regarding people with special needs that have been published by various academics and disability policies

that were adopted in South Africa after liberation in 1994. The desire to comprehend the experiences of students with visual needs has grown in relation to the transformation. In addition, international initiatives to deal with the challenges that students with visual needs go through led to implementing numerous policies and technical developments. According to Nene (2019) these policies include the World Program of Action, the United Nations Standard Rules on Equalization of Opportunities for Persons with Disabilities and the World Declaration for Education for All. In South Africa, means to deal with discrimination have included the education white paper 6: special needs education and The White Paper on The Integrated National Disability Strategy. This policy has assisted in shaping an inclusive education system. According to the White Paper on The Integrated National Disability Strategy (1997) individuals with special needs are capable individuals who play an essential role in creating change. The education white paper 6 (2001) claims that students with different needs must be developed, enjoy and benefit from the educational system, as well as to provide them with the necessary learning foundation.

1.3 Important research questions and objectives

This study's major objective was to investigate and comprehend the experiences of students with special visual needs from UKZN PMB campus. It is aimed to explore the impact and ethical implications of assistive devices on students with special visual needs. The study has only considered the experiences of students with only visual needs studying at UKZN PMB Campus.

1.3.1 Important questions and sub-questions

1. Which obstacles in terms of institutions, environments, communication, attitudes, social economies or teaching and learning do the students regularly face? What are the ethical implications of assistive devices used by the students?
2. How have the students managed the difficulties that their societies have given them, notably during social occasions or while attempting to use public facilities? What opportunities and fulfilling social experiences may be shared with and used by other students to help them learn about assistive devices and independence?
3. How well do students who do not have special needs understand the use of assistive technology? What are the many methods for raising public awareness of people with special needs? Are assistive devices successful in fostering inclusion and integration among various students?

4. How do the UKZN PMB Campus students with special visual needs interact with the many departments to support their learning process on campus? What are some of the strategies used to guarantee accommodations at the university?
5. What strategies does the Disability Support Unit (DSU) use to make sure students with special needs have access to or obtain the devices they need? What methods does the DSU use to improve the life of students towards their learning, including achieving excellence? How can the study's findings impact the accessibility, cost, and dissemination of knowledge regarding these devices?

1.3.2 Objectives of the research

1. To clearly comprehend the experiences of learners with special visual needs at UKZN PMB Campus and to understand the impact and ethical implications of assistive devices in their lives.
2. To understand the difficulties and experiences that students with visual requirements face, as well as how they adapt to their environments and overcome these difficulties.
3. To determine the inclusion that assistive devices may lead to and the methods for raising knowledge of these devices.
4. To investigate the various strategies employed by UKZN PMB to help and accommodate students with special visual needs to be as autonomous as possible.
5. To determine how the results of this study will be applicable and what role the DSU play in providing aids to students with special visual needs.

1.4 Conceptual and Theoretical Framework

Herring (2014:22) argues that the disability studies approach is an important instrument for enhancing “the lives of students with special needs,” resulting in enhancing people’s life. According to Herring (2014), this approach is founded on the understanding that people with special needs are not disabled; rather, their obstacles compel them to be constrained or to have demands. The disability studies approach promotes empowerment and a clear sense of self-understanding for people with special needs and offers a positive perspective on how people with special needs see themselves. On the other hand, classifying individuals with special needs as “disabled” or having a “disability” is a concern. Therefore, the link between using the term

“disability studies” can be significant in understanding individuals with special needs.

This will show that individuals with special needs have limitations that are created by the environment or society. In addition, the absence of financial freedom and independence creates a disabling environment which also plays a role in the class struggle. Thus, the effects of having or using assistive devices creates more opportunities and removes the limitations. Herring (2014) and Hamraie (2016) employ a strategy to both characterize socio-political constructions of special needs and track the repercussions of these constructions on marginalized individuals. Disability studies relates on the daily challenges and aims to change different circumstances that individuals with special needs live under. It also takes the history and creation of special needs identity very seriously. Disability studies, according to Shildrick (2007:233), “is substantially linked with a post-conventional theoretical approach”.

A post-conventional approach means that these individuals have different ethical principles that include basic human rights such as justice, life, and freedom. Individuals that use post-conventional morals view rules as useful but changeable to accommodate their special needs. This means that both the post-conventional approach and disability studies focus on creating independent ethical morals and understandings. According to Meekosha and Shuttleworth (2017:34) disability studies also aim to build on and analyze “the accomplishments of working via more modernist special need’s paradigms, including the social constructionist model.” The social constructionist approach focuses on how reality is constructed through human interaction. According to this theory, one's reality is unique and does not align with others' realities. The social constructionist theory looks at how one's learning and development evolve from human interaction.

It explores the active process of knowledge based on human discourse and experience. Social constructionism is a helpful approach to understanding social problems more especially issues facing individuals with special visual needs. Issues like discrimination can be understood by analyzing the causes and effects of individual and community perceptions. The use of the word disability studies also represents a shift away from binary understandings, such as the social versus medical paradigm and disability versus impairment. The social model of disability is a way of viewing the world, developed by individuals with special needs. The model argues that people are disabled by barriers in society, not by their impairment or difference.

Barriers can be physical, like buildings not having accessible toilets. Or they can be caused by people's attitudes to difference, like assuming that individuals with special visual needs cannot do certain things. The social model plays an important role in noting barriers that make life harder for

individuals with special needs. Removing these barriers creates equality and offers individuals with special needs more independence, choice, and control. It is also important to consider that how anyone chooses to talk about their impairment is up to them. Negative attitudes based on prejudice or stereotype can stop individuals with special visual needs from having equal opportunities. Negative attitudes can include assuming that individuals with special needs cannot work, live independently, and have children. On the other hand, the medical model focuses on what is 'wrong' with the person, not what the person needs. It creates low expectations and leads to people losing independence, choice, and control in their lives.

Theorists of disability studies focus on activism in their work and do not want their theories to only be used in academic settings. For instance, Julie Avril Minich (2017) asserts that studying normative ideologies is a necessary component of disability studies. To achieve emancipation, academics should focus on social justice, accommodation strategies, and working in solidarity with those who have special needs. According to Hamraie (2016), disability studies is an emancipatory and developing discourse. This means it is important to understand and explore the life of individuals with special needs. Examining the disability study theory will play a significant role in this dissertation. This fundamental theory builds a solid foundation for the study in the field of ethics and the life of persons with different special needs. Using disability study theory and ethics encompasses a broad understanding of different approaches to analyzing society and disability study. This includes understanding the impact of the society on individuals with special needs.

1.5 The study methodology

This study uses a qualitative research project based on an informative framework. This study makes use of both narrative and desktop research methods. This dissertation employs narrative research methodology to investigate how people use assistive devices and the various experiences of students with special visual needs. According to Ritivoi (2009:78), “narrative research is a collection and analysis of people's stories in order to describe experiences and offer interpretation”. Using the qualitative research method, I have explored personal experiences and have made use of a questionnaire and interview schedule through narrative research. Narrative research of personal experiences can aid in the development and provision of assistive devices. The aim of the research study focuses on exploring the experiences of individuals who have special visual needs at the UKZN PMB campus.

The goal is to also to better understand how assistive devices affect the lives of people with visual impairment. According to the Intelligent Human systems Integrity (2021) the desktop approach is to review various scholarly literature, establish themes, and provide critical ideas and important findings. According to Mthethwa (2017:5) "as the name implies, desk analysis is part of a research methodology that is mainly conducted through reviewing different articles", Mthethwa (2017:10) also states that "desk approach method entails collecting information from other sources or existing infrastructure." As a result, it is frequently regarded as a low-cost method in comparison to field research, as the main costs are executive time, phone charges, and directories (Mthethwa, 2017). Purposive/judgmental sampling was utilized as a non-probability sampling design in this study.

This means that participants were chosen based on their ability to provide detailed information that would be important in the study. Among the participants, randomly selected students who are registered for help with the disability unit are included in the study, this includes students from different levels of study. The study only involved 20 students/participants which were divided into 8 males and 12 females. The interviews were conducted through online platforms and face to face. A semi-structured interview schedule and a questionnaire was used to collect data. It was also important to record the interviews in this study to ensure that the transcribed data is accurate and reliable. It was also important that during each interview, an informed consent form was explained to the participants and signed. This ensured that the participants understood all of the research procedures.

1.6 Outline of chapters

Six chapters make up this dissertation. What is found below is an outline of the chapters. Chapter 1 is an introduction that includes important background details that are important in the study and research questions and objectives. The second chapter is comprehensive assessment and a review of important and existing literature, as well as an examination of the national policy framework and UKZN policies. It focuses on the conflicts over themes and ideas. In chapter 3, the theoretical context and its relevance to the study is discussed and outlined. Chapter four examines and evaluates the research methodologies of the study.

These include specifics focusing on interview questions, including the strategy of selecting participants, which includes detailed interviews. The results of the interviews are provided in Chapter five under specific themes. The chapter also include a summary of the findings and a

discussion of them. The results of the research are reviewed in connection to the conceptual and theoretical context, policy, and literature, which guides the discussion. The final chapter provides a conclusion for the study. Chapter six highlights important findings of the study and discuss recommendations and policy considerations for additional studies.

Chapter 2

Literature review

2.1 Outline and introduction

Throughout the different decades, the development and use of assistive devices for individuals with special visual needs has been growing throughout the world. Although there are still significant ethical implications, the proper use and implementation have been enormous in creating inclusive learning and special needs education. Learners that have had the privilege to access assistive devices perform equally with other students and receive the necessary accommodation means. However, there are still some ethical implications due to affordability, lack of proper training services, and lack of respect for those who use assistive devices by other community members especially from underdeveloped communities. Assistive devices play an important role in higher institutions or universities in limiting the challenges that students with special needs might face throughout the world.

This chapter critically reviews the literature on people with special visual needs' experiences and ethical implications of the use of assistive devices. This chapter begins by outlining the study of ethics in the context of special needs and how the experiences of people with different special needs are understood. The chapter focuses on exploring the impact of assistive devices on students with special visual needs. The chapter explores the different accommodation means in special needs education by focusing on students with special visual needs. The chapter follows up with a discussion on the marginalization and social differences that exist within different communities. Furthermore, this chapter explores the gaps and limitations of using and accessing assistive devices in higher institutions. Finally, this chapter explores and discusses the policy landscape and the implementation process.

2.2 Ethics studies and special needs framework

In the African context of special needs research, the literature on ethics is still relatively undeveloped (Nuwagaba and Rule, 2015). According to Nuwagaba and Rule (2015), not much has been documented regarding how ethical practices have been affected by a shift from explaining special needs through African traditional belief systems to more recent scientific explanations. "The literature on ethics in the African context of special needs research is still relatively

undeveloped" (Nuwagaba and Rule 2015:25). This implies that there is a large room for contributions that will have a significant role in this field. Having more contributions will ensure that this field is clearly understood. According to Nuwagaba and Rule (2015), little is known about how a shift from explaining special needs through African traditional belief systems to more recent scientific explanations has affected ethical practices.

According to Ahmad (2015), the literature available is informed by humanistic and religious principles of helping the poor and marginalized, which regard individuals with special needs as victims in need of charity, and the medical model that views individuals with special needs as patients in need of treatment. The more recent social and human rights models, although based on Western explanations, aim at moving individuals with special needs from marginalization to playing roles in decision-making processes. Unfortunately, these positive social and human rights-based changes that have effects on how special needs research should be conducted are often not yet reflected in ethical procedures and processes (Warnick and Silverman, 2011).

2.3 Exploring the terms “individuals with special needs” and “special visual needs”

According to World Health Organization (2015), individuals with special needs can be explained as individuals who have a long-term or recurring physical and mental impairment, which substantially limits their prospect of entry. An individual with a special visual need is still likely to be able to fulfil their work or duties with reasonable accommodation and reasonable measures. The reasonable measures such as specialized programs include voice-enhanced computers or switchboards that have an essential role towards the life of individuals with special visual needs.
According to Cummins (2002) the Ontario Human Rights Commission claims that special need may be caused by accident, developed over time or be present at birth. This eventually leads to different experiences and dealing with different challenges. An individual with special need has a physical impairment that limits them from doing daily activities or “reduce the amount of work they can perform” (Jette and Field, 2007:30).

Individuals with special needs are divided into two categories: the invisible and visible special needs (Cummins, 2022). Visible special needs include impairments that can be easily identified with serious challenges or needs. These individuals include individuals with an amputation, walking or talking impairment, visually impaired. “Invisible special needs is a term that captures

hidden special needs or challenges that are neurological" (Ginsburg and Rapp, 2013:9). Individuals with invisible special needs include people who have a special need that are not easily observed or recognized including "deafness, special learning disorder, chronic illness and developmental disorder" (Brewer and Ellison, 2020:15).

A visual special need could mean partial sight, low vision, color blindness, or total blindness. According to Bishop and Rhind (2011:11) the term "Special needs are used as an umbrella term for impairments, activity limitations, and participation restrictions". On the other hand, "functioning" can be utilized as an "umbrella word" for the functional and structural integrity of the participation, activities, and body (WHO, 2015). Tomlinson (2014:55) claims that "a special need is created by the environment that the person with a special need, lives under, work, and challenges of the society". This indicates that the environment of the society has a huge impact on the limitations that affect a persons life. Cummins (2022:27) also states that "an emphasis is also placed on the factors that contribute to exclusion and inclusion which affects the understanding and accommodation of the concept of special needs". The exclusion factors limits an individual with a special visual need from fully being part of the society. Thus, this contributes more to the factors leading to lack of accommodation.

2.3.1 Defining assistive devices.

"Assistive technology is any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with special needs" (WHO 2011:101). According to the Zimbabwean National Disability Policy (2021:15) assistive devices are "appropriate aids, appliances, technologies and other support systems that facilitate optimum functioning and participation of individuals with special visual needs". According to Schiemer and Proyer (2013), assistive technology are any tools, equipment, technological advancements that are created or designed to assistive individuals with special needs and that is used to prevent, compensate for, monitor, relieve, or neutralize that need. These definitions provide a significant understanding of the term assistive devices and the purpose of them.

Assistive technology is a tool that can sustain or enhance a student with a special need's mental and physical functioning (Adebisi et al. 2015). This means that the role of assistive devices can be useful towards different special needs. Enhancing different special needs provides a more enabling

and exciting experience for different individuals. According to Erdem (2017) assistive devices have also enhanced the skills of individuals with special needs that are important in their living. Assistive devices can be a tool or software application that helps special education students develop their social, academic, and communication abilities in the 21st century (Assistive Technology Industry Association, 2019). According to Faruk et al., (2023) using assistive technologies in special education is crucial when completing different activities successfully given the necessity for 21st-century abilities. According to the world health organization's (2015) definition, assistive products and technologies include any device that has been expressly adapted or created to help a person with a special need perform more effectively.

Assistive devices are just one term used in the Convention on the Rights of People with Disabilities (CRPD) to identify and categorize the different assistive tools. According to Borg (2011:20) “using a text-to-speech screen reader”, a person with a special visual need can better participate in limited occupational activities. While assistive technology is typically perceived as addressing an individual's "shortcomings" from the perspective of a “medical model” of special needs, the “social model” views it as a facilitator that lowers barriers in society (Schiemer and Proyer 2013). Delivering services via assistive devices enables individuals with special needs to adapt to global information and knowledge growth (Cahill and Cornish 2003).

In developing knowledge economy, particularly in advanced information societies, assistive devices are frequently utilized as instruments for information collection, processing, storage, retrieval, and dissemination (Chaputula, 2012). Although assistive devices open up new possibilities for everyone, people with special needs benefit more from these chances since they rely on technology (Cahill and Cornish 2003). Assistive devices for individuals with special visual needs include “talking books, screen magnifiers, screen readers, text-to-speech synthesizers, Braille embossers, big print processors and voice recognition software, and” (Tripathi & Shukla 2014:105).

2.3.2 Benefits of assistive devices

Assistive devices have many benefits which influence various facets of their users’ daily living. They include academic, bodily functions and structures benefits (Langton & Ramseur, 2001). According to Beijen et al., (2007) and Parette & Peterson Karlan (2007:31), “assistive devices are

crucial for academic productivity and success in addition to facilitating access to education." As one of the most effective methods for accommodating job duties, assistive devices are thought to improve employment outcomes. According to Borg (2011) assistive devices also remove barriers to employment, self-esteem and increase productivity to people with special needs.

Assistive devices can be crucial for maintaining a person's physical and mental health (Veehof et al., 2006). Success cannot be assured even if assistive devices have the potential to improve quality of life (Johnson et al. 2007). Beyond the technology and the user's physical characteristics, it is important to consider meeting their requirements, preferences, and expectations (Brown-Triolo et al., 2002). According to Mthethwa (2017:56) "students with special needs may be required to use new software packages and other information technologies."

Students with special needs have difficulties in their academic lives without these support aids in higher education. Students with visual impairments benefit from screen reader programs because it enables them to "hear the text that is displayed on a computer screen" (Adebisi et al. 2015). Screen reader programs are a significant advancement over Braille because, after the software is set up on a computer, this allows students to actively participate in online classes, communicate via text and email to ensure that they also receive their notes on time (Johnson et al. 2007). There are numerous free versions screen reader programmers, including Natural Readers which are found online. They have proved to be beneficial to students with special visual needs.

2.3.3 Accessibility and General and specific actions

Accessibility is one of the CRPD's main goals (Scherer, 2005). Roulstone (1998); WHO (2002) states that using assistive devices requires that the environment is accessible, and accessibility measures allow an easy use of assistive devices. Assistive devices are designed and improved to ensure an accessible environment for individuals with special needs (ISO 2007 and Scherer et al. 2007). Not all accessibility-improving initiatives, such as patching potholes in sidewalks, which also enhances accessibility for people with special needs, may be categorized as assistive equipment (Cahill and Cornish 2003). Tomlinson (2014) states that governments are required to carry out or support research and development relating to assistive technology, to encourage the use of and availability of assistive devices, this includes offering information that is accessible about these technologies.

Governments must provide Braille signage in public buildings and other facilities to well accommodate students with special needs (Schiemer and Proyer 2013). According to Mthethwa (2017) governments must guarantee the right to communicate in all ways. This must include facilitating and accepting using augmentative and alternative communication, braille, and other chosen methods. Additionally, professionals and staff should receive training based on using appropriate alternative and augmentative modes, different ways and means of communication in addition to hiring qualified teachers.

Cahill and Cornish (2003) suggest that it is important to ensure the accessibility, understanding, and using different assistive devices for rehabilitation. Governments are required to make assistive devices accessible for running for office, voting, being involved in public office, and taking part in other official responsibilities (Johnson et al. 2007). Cooperation between and among governments, international and regional organizations, and civil society organizations will make it easier for people to access and share assistive devices.

2.4 Role of digital technology in artistic work

For the Association for Technical Aids (2019), the aim of assistive devices is to ensure that physical limitations are reduced and making sure that the digital tools are improved to support artistic endeavors. Coleman and Cramer (2015:15) "explore the different assistive devices (digital and non-digital adaptations of traditional tools) that are utilized to play an important role in the life of students with special needs who have an interest in taking part in creative skills". Diment and Hobbs (2014:46) introduced the "Kinect Virtual Art Program which uses the Microsoft Kinect sensor to control the gestures of people with visual impaired". The gestures were utilized as part of making innovative work inside a "therapeutic context" to allow individuals with motor special skills to create free-form drawings. Harada et al., (2007) discussed the importance "voice recognition as part of making graphic work" which would focus mainly on individuals with special needs.

Gips and Olivieri (1996) discussed an application called "Eye Painting\that mimicked finger painting with a user's eyes to create basic colored line drawings." Hornof and Cavender (2015:35) also developed "Eye Draw, an application for students with special needs that allowed them to draw and manipulate basic shapes through gaze tracking." A graphics application Eye Sketch that allowed users to produce graphics and manipulate shapes with their eyes was developed (Heikkila

2013). On the other hand, Van der Kamp and Sundstedt (2011) discussed the mixture of "voice recognition" "for menu selections" and "eye gaze for drawing pictures in their application." Finally, Kwan and Betke (2011) developed "eye-operated image editing software (Camera Canvas) for people with physical impairments".

The above literature provides of examples the importance of digital technologies and how they have an important role towards the life of individuals with special needs. However, there are no literatures that are specifically geared toward expert special needs artists. Hence, it is unclear how digital artists complete duties or tasks and how digital technologies are being used to enhance their work.

2.5 Individuals with special needs and Assistive devices

For Faruk et al., (2023) there is a greater requirement for software use, assistive devices and improvement in the educational curriculum due to the demand for 21st-century skills. The proper use of assistive devices, choosing the right assistive devices, where to get them, how to use them, and how to assess their effectiveness are issues that teachers and other professionals deal with (Adebisi et al. 2015). In light of these factors, teachers and other professionals' roles are crucial in determining the best assistive devices for students' development in the twenty-first century. To design a meaningful curriculum, it would be advantageous for all parties concerned to be aware of the strengths, weaknesses, and particular special needs that each student in special education has. According to the Individuals with Disabilities Act (IDEA) (1997) all schools are required to offer aids, services, and equipment to students with special visual needs. The Individual Education Program must include assistive devices under the revised IDEA (1997).

The demand for accommodating individuals with special needs is increasing around the world (Jette & Field 2007). Students and teachers in special education settings use assistive devices regularly. With the use of assistive devices, tasks that were previously impossible or difficult for students in special education to complete can now be completed. Fuller et al., (2004:48) state that "it would be simple to believe that legislation will create, or have created, a higher education environment that can accommodate all support need." However, legislation per se does not always result in appropriate practice or action, so assistance for students with special needs as well as removing institutional barriers should be considered.

Mthethwa (2017) argues that students with special visual needs frequently go through a vicious

cycle of behavioral conditioning at school. Due to their learning challenges and the perceived stigma towards students with special needs can carry, they may experience low self-esteem. In some circumstances, this harmful cycle of “behavioral conditioning” and “low self-esteem” can lead to learners changing their “social skills,” “having trouble interacting with their peers” and acting out frequently in schools. However, through using modern assistive devices, students can improve their social skills through different environment, which raises positive “self-esteem” towards the academic and social prowess (Council on Higher Education, 2005). With the help of assistive devices, teachers can establish collaborative, international learning environments that connect students with peers around the globe and promote collaboration across cultural groups.

2.5.1 Mobility Use of the assistive device

According to Pionke et al., (2019:21) “today, more people use electric scooters and wheelchairs in addition to more conventional mobility aids like canes, walkers, crutches, and prosthetic devices.” Student independence depends on allowing them to move around freely while sitting (Erdem 2017). With the aid of assistive devices, students with limited mobility can actively engage in different activities with other students (Erdem 2017). Mouth sticks, GPS tracking devices and wheelchair routing devices are part of the important devices used today to support students' mobility. According to Council on Higher Education (2005), mouth sticks are used by students with mobility issues to complete tasks independently. Students can input information and control the mobility device using a stick that they can easily control with their mouths (Pionke et al. 2019).

Mouth stick tools help students succeed because they let them use their creativity to finish tasks (like painting with a mouth stick) and practice computer keyboarding. The traditional wheelchair has changed over time, today, the majority of wheelchairs are using electricity and have cutting-edge routing tools that will simplify life for students (Mthethwa 2017). Students can easily navigate through public spaces with the aid of wheelchair-routing tools (Price 2014). Nene (2019) states that the routing tool helps students move around freely, which is advantageous for their independence. It promotes students' freedom to work together both inside and outside of the classroom. “The improved technological GPS tracking device” is also a mobile tool that uses satellite technology to direct traffic and pinpoint a person's location. Because it enables visually impaired students to navigate freely, it is a great mobility aid (Erdem 2017).

2.5.2 Speech Recognition Software and learning use

Students who have trouble speaking or hearing can benefit from using assistive devices (Erdem 2017). Today, speech-generating equipment and speech-recognition software are some of the most common assistive communication devices. Adebisi et al., (2015) states that students can use a microphone to speak on the computer which generates spoken words as texts. The ability to select undiscovered words while speaking makes this kind of assistive device useful for students (Adebisi et al., 2015). It is advantageous for students who struggle with their oral language skills, limited mobility, and motor skills (Nuwagaba and Rule 2015).

"Speech Generating Devices are portable and have one or more pieces that when pressed will activate pre-recorded synthesized or digitized speech" output (Illinois University Library 2019). Assistive devices are also beneficial to students with special needs who are not able to speak, therefore, they use a speech-generating device to interconnect with other individuals. By supporting their students' positive thinking and active learning, teachers can aid students with special needs in developing their 21st-century communication skills (Mthethwa 2017). With the use of computer applications to collect and share information in schools, teachers can incorporate assistive devices and communication tools into the curriculum.

Moreover, there are numerous assistive devices in the market today that can aid students in developing their skills. Optional character recognition, tape recorders, variable speech control, talking calculators, spell checkers, free-form databases, proof-readers, electronic mathematics worksheets, FM listening systems, personal data managers and prewriting organizers are some of the tools that could play an important role towards difficulties such as organization, reading, writing, listening and memory (Warnick and Silverman 2011).

2.5.3 Google Read & Write

According to Nene (2019), google read & write is among the most helpful apps on "google drive." "Google read & write" software is an effective example of assistive device that enables teachers and students to collaborate, create, and consume content anywhere within the school (Erdem 2017). "Google Read & Write is a program that allow talking dictionary, translator, read-aloud with dual color highlighting, picture dictionary and fact finder" (Miller 2013:89). Texthelp (2019)

claims that google read & write enables students to write, read, and express themselves confidently, is easily used in schools to create a significant impact. Students and teachers can now access documents, files, and web pages more easily due to this simple toolbar (Cummins 2022). Because it gives those who struggle with reading and those with learning special needs more confidence, "google read & write is an effective tool for 21st-century learning." It aids dyslexic students and enables students with literacy difficulties to advance their learning abilities (Jette & Field 2007). Google read & write can be incorporated by teachers into the curriculum to assist students in finishing their assignments and projects independently. Teachers can come up with a variety of in-class activities that encourage discussion and teamwork while utilizing google read & write. This educational software functions as a full-time assistant to assist students in speaking, reading, and writing on their behalf, which can help students develop their 21st-century skills (Erdem 2017).

2.6 Traditional classroom, online learning, and assistive devices.

According to Mthethwa (2017) the development of online learning can be more accessible for many students, this is due with the fact that traditional classes are sometimes challenging for students with special visual needs. Through online classes, students with special visual needs can easily attend by using their software which makes life better. The use of assistive devices provides students with special visual needs with equal opportunities which allow them to fully compete with non-special needs students. Mthethwa (2017:57) states that "it is important to take into consideration the different special needs and the new technologies that are designed to meet the different needs to ensure equality."

Erdem (2017:79) state that "all students, including those with special needs, should be allowed to participate in all learning environments". These learning environments must be suitable for different students and their needs. Adams and Brown (2011:5) adds that "it is important to note that some students perform equally with other students in settings with fewer distractions". An important way to make sure that learners with different special needs have the right and privilege to different learning environments which allow them to learn in different schools and accommodate them accordingly (Ahmad 2015). Andrich (2013) adds that accommodating students with special visual needs includes integrating them to platforms such as online learning.

The advantages of online learning include that students with special needs can easily concentrate in their classes in their private spaces (Erdem 2017). According to Mthethwa (2017:34) “even though every condition is unique, and some students have more than one, students with special needs encounter a number of learning challenges in the traditional classroom setting”. These challenges include being physically challenged to move between buildings for various classes or having trouble using the same routes as other students.

2.6.1 Library services

With the aid of assistive devices, individuals with special needs are better able to communicate, take advantage of library services, have unrestricted access to information, and avoid issues with digital and social exclusion (Lloyd et al. 2016; Ragnedda 2017). Unfortunately, most libraries do not pay enough attention to providing students with visual impairments with assistive devices. These students encounter barriers to information access, a lack of books in accessible formats, and partial or complete exclusion from policies governing library services and online access (Zaid 2017; Kaunda and Chizwina 2019). Libraries should not be excluded from the widespread adoption of new technologies (Oyelude 2017).

By effectively using the different assistive devices, students with visual impairments can participate in studying or using library services in their societies or institutions (Munin and Yu 2017:446). In addition, assistive devices help students with special needs overcome challenges in the digital environment, giving them the same opportunities as their sighted peers (Koulikourdi 2008). These opportunities ensure that students can deal with the different challenges they face.
The CRPD required that assistive devices be made available to individuals who have special needs in all libraries throughout the world (Golledge 1993). The World Health Organization (WHO), in collaboration with UN agencies, donor organizations, trade associations, academic institutions, and businesses through the Global Cooperation on Assistive Devices is strongly in favour of this mandate (WHO 2015). Individuals with visual impairments can now use library services more independently thanks to advancements in assistive devices.

Academic libraries, which Okiy (2012) refers to as the "lifeblood" of higher education institutions, can greatly profit from the services offered by assistive devices (Ogunsola and Aboyade 2005).
According to Myhill (2002), all libraries must provide access to information for all users,

regardless of their different special needs. The information resources available in many libraries and information resource centers have undergone a notable change as a result of the implementation of assistive devices. As a result, the use of assistive devices is crucial towards the provision of information to students who have different needs in academic libraries (Munin and Yu 2017).

Assistive devices promote independence, by adapting different tools to individuals with special needs to remotely access information sources rather than physically visiting the library. Majinge and Stilwell (2014) investigated the role of assistive devices in information delivery to student with different needs in academic libraries in Tanzania. This investigation was motivated by the problem of providing universal access, and in particular getting the right to use information for students with visual impairments in higher education (Majinge and Stilwell 2014). The study recommended that it was essential for libraries to accommodate individuals with special visual needs.

2.6.2 The use of tablets, Computers, and visual displays for the provision of students with special needs

Antonioli Blake and Sparks (2014:205) state that "Similar to auditory learners, some students with special needs respond best to visual engagement with information." Students with special visual needs find the use of visual displays easy to memorize and to engage with. Visual displays include using pictures and videos. According to Takahashi et al., (2018) "students can design and model science projects with a tablet app." An innovative teacher has the ability to introduce creative ways to incorporate visual assistive technologies into the learning spaces. Kendall (2016) states that assistive tools and other interactive technologies such as computers can be important in making learning accessible to different students. The use of computers and tablets in educational games or lessons can be important to the education of a tactile learner in order to achieve excellence, through ensuring learning and sharing information through sound, touch, and sight (Takahashi et al., 2018).

2.7 Inclusive education

Kendall (2016:1) and Majoko (2019: 1) argue that "as the number of students with special needs in higher education continues to increase", the need for quality inclusive education remains important. Inclusive education plays an important role to many students with special needs

(Sibanda 2018). Sibanda (2018: 809) states that “inclusive education is the only realistic means of achieving education for all". “Inclusive education has brought with it a much-needed share of equity in the approach to the education of students with special needs by providing them with a level field to appropriately showcase their diverse talents” (Ahmad 2015: 62). Sibanda 2018:809) states that “inclusive education includes equity, fairness, participation, diversity, and access in terms of educational provisions”.

Matter et al. (2016: 1) states that “previously published research about assistive devices has been limited despite their advancement.” “Research on inclusive education has been concentrated on the successes in developed nations” (Ahmad 2015: 62), and a limited amount of research has been published to describe how assistive devices are used in higher education settings (Malcolm & Roll 2017: 91). Jenkinson (1997:37) states that “success in inclusive education is possible if there are proper assistive devices and adequate resource staff. Such teachers will be better trained on how to educate learners with special needs.” Wang (2019:19) claims that “there has been a growth of interest in widening access and participation of students with special visual needs in inclusive higher education”.

Hanafin et al. (2007:91) state that “inclusive education has positive changes in the academic practice, as it aspires to give equal voice to both students with special needs and non-special needs students.” This is created to show the improvement or development of teaching, learning and quality of the education system. “In adapting to an inclusive education system in higher education institutions, all students will benefit from the agenda of inclusive practice” (Waterfield et al., 2006). According to Mthethwa (2017:88) “at UKZN, the posting of lecture notes to an e-learning system in which students with special needs and non-special needs have equal access to retrieving those notes is an indication of inclusive education practices that benefit all students.”

Mthethwa (2017:82) states that “Inclusive education in higher education is an issue both of equal opportunities and empowerment for students with special needs. For students with special needs to access equal opportunities and to be empowered, higher education institutions should look at reducing the barriers these students may encounter in teaching, learning, and assessment”. “Importantly, inclusive education is based on values and principles founded on the broad agenda of human rights, and strongly stating that segregation is incorrect. This is because inclusion improves children in their academic achievement through their participation in group work,

building good communication through parent-teacher, and the speech and language of the child" (Jenkinson 19997:40).

2.7.1 University of KwaZulu-Natal mission statement

UKZN (2004) introduced a Policy for staff and students with special needs. According to UKZN (2004:2) this policy states that "UKZN committed to making tertiary education and the working environment universally accessible and inclusive for all students and staff including those with special needs.

2.7.2 Support systems and Barriers

According to Shevlin, Kenny, and McNeela (2004), appropriate support systems are vital in ensuring equal access for students with special needs in teaching and learning. The commitment of the institution to facilitating support and participation depends on its willingness to change admission, curricular and assessment procedures as well as the physical accessibility of the institution. Many students with special needs experience barriers to learning and development. A barrier is described as any aspect, either internal or external to the student, which causes an obstacle or impediment to their learning, development, or participation in higher education (Greyling 2008). Students with special needs struggle with attaining alternative arrangements such as rescheduling classes to accessible buildings for wheelchair users and providing Braille or electronic text for students with visual impairments (Dowrick et al. 2005). These authors caution that institutions should coordinate special needs support services and programs to educate faculty, peers, and employees about support systems, accommodation, and the rights of individuals with special needs. Moreover, it is widely noted that barriers like negative attitudes and the unwillingness of the academic staff to provide arrangements affect the progress of students with special needs in higher education (Dowrick et al. 2005).

2.7.3 Disability Support Unit

In 1995, a Disability Support Unit (DSU) was established at the former University of Natal to assist students with special needs in realizing their academic potential and to maximize opportunities for their personal development (Mthethwa 2017). Services provided by the DSU include, providing academic support for students with special needs in the form of liaising with

academic schools, converting material into Braille, providing audio recordings, and handling applications for extra time for texts and examinations. The DSU also provides assistance with financial aid, seeks to increase awareness around special needs issues, provides orientation and mobility training for such students, and offers counselling and individual support (UKZN 2007). Naidoo (2010:29) states that "appropriate support systems are vital in ensuring equal access for students with special needs in teaching and learning".

The DSU is a structure, which provides special support and needs for all students with special needs. UKZN aims to ensure that it provides a modification of all academic courses to accommodate students with different special needs. The modification is mostly to ensure that students with special needs acquire all academic materials required by any other student. The University of Cape Town (2011) also has a similar support system for students with special needs in providing academic access. The type of the academic support includes advocacy and advice on any issues related to the students with special needs, consultative and counselling support for students with special needs, a resource center with literature and material relating to special needs studies and special needs research, physical access, assistive devices, technical assistance, parking for students with special needs, and facilitation of extra time and other examination accommodations for students with special needs.

It is also seen that the service which UKZN provides to students with special needs is not only similar to that at the University of Cape Town but also similar to Northumbria University which is an international institution of higher learning. Students with special needs need to overcome the challenges which they experience at UKZN. The UKZN undergraduate prospectus (2016:52) points out that "The Disability Unit, in collaboration with schools, is responsible for developing and facilitating a wide range of services for students with special needs".

The challenging of accessing study material remains a challenge for students with special visual needs (Dowrick et al., 2005). As a result, a DSU needs to continuously provide staff and students with training and awareness workshops regarding students with special needs. It takes the entire community working together to support a student with special needs; the disability advisor, or the disability liaison officer alone cannot do it. Additional services provided to students with special needs by the DSU include application guidance and assistance for students with special needs allowance, information, and guidance on services available at the university and in the

neighborhood (Northumbria University, 2006).

2.7.4 Availability and Affordability of assistive device

The availability of affordable high-quality assistive devices is a serious problem for many individuals with special needs (Scherer 1996). The market for assistive devices is characterized by relatively small companies, mostly with a national or regional scope. Exceptions are in the fields of wheelchairs, prosthetics, and orthotics. However, according to World Health Organization (2015), the number of products sold are insufficient to reach an economy of scale to reduce production costs and lower prices. As a result, most assistive devices are expensive. In high-income countries, many assistive devices are only available to those who can afford to buy them privately, rather than through a public provision system (Scherer 1996). For low- and middle-income countries, assistive devices are out of reach. Although everyday technologies like smartphones and tablet computers are becoming more easily available, they are still not affordable for the majority of individuals with special needs (Rohwerder 2018).

The assistive device market is not an open market, since end users generally have very little choice (Rohwerder 2018). Decisions are made by intermediary bodies like insurance companies or municipalities, or by donor-driven organizations and projects, but very rarely the user directly. This creates a market in which there are clear needs but users without direct purchasing power. Additionally, World Health Organization (2015) states that procurement of assistive devices is often outsourced to third parties. While bulk procurement of assistive devices by governments, insurance companies, or other agencies can reduce time, effort, and costs, it increases the distance between end users' needs and outcomes and purchasing decisions. With the publication of the Priority Assistive Products List (APL), the WHO has set a minimum standard for assistive devices that should be available in all countries (WHO, 2002).

Companies should be strongly encouraged to produce and sell high-quality assistive devices on this list at the lowest possible prices without compromising on quality standards. For some assistive devices, this will require research into new production techniques and supply chain efficiencies, including local production to shorten the delivery chain and save costs for transport. In countries without production capabilities, arrangements for easy trading and import tax waivers should be considered (Sujatha, Bapat and Dash 2021). The availability and affordability of

assistive devices can be strongly stimulated by challenging companies to produce and sell high-quality products from the WHO Priority Assistive Products List (APL) at affordable prices, and by stimulating research into new production techniques, including local production of proven technologies.

2.7.5 Information systems

To be able to benefit from any assistive device solution, individuals with special needs need to be aware of the different assistive devices (Bateni and Maki, 2005). This implies that information systems play a role in any assistive device provision system. Such information should be available to end users as well as professionals involved. Effective awareness-raising is challenging, and information provision should be considered as an ongoing dialogue rather than a one-off transaction (Andrich 2013). Wouters (2015) states that the challenge is not only to provide information about the existence of assistive devices but also about their quality, usability, effectiveness, and availability. Preferably, such information is neutral/independent (not influenced by commercial or other interests) and supported by research evidence that is based on user experiences.

In Europe, there has been a long-term investment in providing information about assistive devices (Wouters 2015). This has led to the European Assistive Technology Information Network (EASTIN) search engine, which connects websites from several European countries and makes the information publicly available to end users and professionals (Andrich 2013). According to Velázquez (2010) in the United States of America, a similar database exists: Able Data, and Australia has such a database: National Equipment Database. However, it is a major challenge to keep this information up to date. In most developing countries such information systems are not available and the concept of information through a website is still non-existent. Here, information dissemination needs to be done through community-based channels in print or verbally (Velázquez, 2010). States should take responsibility for such information systems and ensure their availability and quality.

It is essential that countries assure neutral/independent based information about assistive devices and related services that are available for end users and professionals. The WHO priority APL provides a good starting point for developing such national information systems and the structure of the EASTIN website provides a useful framework to build upon (World Health Organization,

2016).

2.7.6 Professional services, advice, and support

Information about assistive devices is necessary but insufficient to ensure adequate assistive device provision (Saborowski and Kollak 2015). Developing an individual assistive device solution (which is the device plus related support and services, such as training for the user to safely and effectively operate a given product) requires high-level professional knowledge and skills. Not only knowledge of the available assistive devices and how to use them but also knowledge and skills to assess the needs and ambitions of the individual (Wouters 2015). However, Seiders (2015) argues that there is no specific discipline trained for this task, except for the field of prosthetics and orthotics. Assistive devices are not frequently enough a major topic in the training of healthcare professionals, and different healthcare professionals have different scopes and depths across assistive products.

Occupational therapists have the best basic training to play a role in assistive device provision and service delivery, but in many countries, this discipline does not exist or only in very low numbers (Bateni and Maki 2005). Only some countries offer postgraduate courses in assistive device provision, resulting in a serious lack of expertise and skills available in most countries (de Witte et al. 2018). Developing training programs for professionals to work in this field is fundamental to improving assistive device provision and service delivery worldwide. Professional organizations like Association for the Advancement of Assistive Technology in Europe (AAATE), Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), and Australian Rehabilitation & Assistive Technology Association (ARATA) can play an important role in developing such programs (de Witte et al., 2018).

According to Seiders et al. (2015), it is very important to increase the number of assistive device advisors. The traditional way of training them in formalized education systems will take many years. Therefore, other approaches to training should be applied, for example, building on the "train the trainer" principle in which existing assistive device advisors are trained to train colleagues around them about the principles of assistive devices. Such a pyramid-like structure of training may improve awareness and access to assistive devices and service delivery worldwide, especially in low- and middle-income countries.

It is essential that training programs for professionals to work in the field of assistive devices are developed and become available worldwide (Saborowski & Kollak 2015). In connection with this, the development of an accreditation system for assistive device experts might be considered. De Witte et al. (2018) state that assistive device experts involved can be healthcare professionals but also social and community workers. If there are assistive device experts with sufficient knowledge and skills, it is essential that they offer independent advice and support. In most countries, such independent advice does not exist. The available professionals are directly linked to and work on behalf of the commissioning body and sometimes for the manufacturer of certain assistive devices (Seiders et al. 2015).

Each country should assure the availability of independent centers of expertise where people can get high-quality advice and support in the process of obtaining assistive devices (Andrich 2011). All assistive device experts involved should have clearly described roles and responsibilities and their competencies should be embedded in international standards of education and training that define core competencies.

2.8 Eligibility and funding mechanisms

According to Ebuenyi et al, (2022), a key policy issue concerning funding mechanisms is deciding who is eligible for obtaining assistive devices and determining the range and extent of funding. In contrast to the intentions of the Convention on the Rights of Persons with Disabilities most countries rely on medical definitions and diagnostic criteria to determine eligibility. Developing eligibility models that start from a functional perspective and individual ambitions and context of a person to participate in society is a major challenge to improving assistive device provision worldwide (Rohwerder 2018).

Hussain and Brown (2022) state that the International Classification of Functioning, Disability and Health (ICF) framework offers a starting point that can be used to operationalize (parts of) these models, and some interesting instruments have been developed that could play a role in this, but a generic decision model does not exist yet. Such a model would help to distribute available resources fairly and equitably to those who need them most, irrespective of the funding mechanism chosen (van Dam et al 2023).

2.8.1 An international standard for the Provision of assistive devices

MacLachlan et al. (2018) claim that without a standard method or tool to connect services and outcomes, there will be a lack of comparable data for assistive devices, leading to problems in assessing the impacts of current policies and developing new ones. The development of an internationally relevant, evidence-based infrastructure for assistive devices is critical to advancing all aspects of the global priority research agenda regarding assistive devices (Bernd Van Der Pijk & De Witte 2009). A process standard for assistive devices provision would define a standard of practice with benchmarks to assess the quality of services, provide the basis for educational curriculum and certification, and enable the collection of data to assess the impact of assistive devices for policy decision making (Borg, Larsson, and Ostergren 2011).

The establishment of core quality performance indicators for assistive devices provision will support efficient and effective services by optimizing decision-making. How services are provided will be governed by national legislation, specific regulations, and cultural expectations. There are established processes for developing and appraising international standards from different countries (Cook & Polgar 2014). According to MacLachlan et al. (2018), such a standard should be based on interdisciplinary conceptual and process models and adopt a common "language". An assistive device process standard should assure the user remains central to all activities, enable interdisciplinary interaction, apply to any type or level of special need, and address the factors which influence user satisfaction. A standardized framework for assistive devices service provision would allow for the insertion of existing and evolving performance standards at both the individual and organizational levels (Arthanat, Elsaesser, and Bauer 2017). The evolving performance standards would function as a platform to develop and support further strategies and resources to improve assistive device provision worldwide.

2.8.2 Convention on the Rights of Persons with Disabilities (CRPD)

Since the adoption of the United Nations' Convention on the rights of persons with disabilities (CRPD) in 2006, assistive devices have been promoted as a means to promote personal independence (Maor et al. 2011), increase access to information (Pomputius 2020), and assist students in achieving positive educational outcomes (Ahmad 2015). Public assistive device provision systems have been in place in many countries for many years, as part of their national

or regional healthcare and welfare systems (UN General Assembly 2006). With the publication of the United Nations CRPD, an international legal obligation for countries was created. This convention, among many other things, commits the ratifying states to enforce appropriate measures to facilitate access to assistive device solutions for those who need them to improve independence in daily life and to participate in society on an equal basis with others (Kayess and French 2008).

The CRPD has encouraged the development of assistive device provision systems, policies, and procedures and granted at the status of a human right. According to Marton, Polk and Fiala (2013), the CRPD sets standards for ratifying countries to meet while addressing the inclusion of individuals with special needs. It is built on principles including "respect for inherent dignity" individual autonomy including the freedom to make one's own choices. "Ratifying states are obliged to ensure and promote the full realization of individuals with special needs including promoting the availability, knowledge, and use of assistive devices" (Kayess & French 2008:8). According to UN General Assembly (2006), more than 170 countries have ratified the CRPD, indicating a commitment to give effect to the rights it embodies and be bound by its guidelines. Ratifying states are obliged to harmonize their relevant national laws and policies with the CRPD.

This would mean designing laws and policies in such a way that they ensure access to support services including assistive devices for all individuals with special needs requiring it. It is a question of human right that individuals with special needs have access to assistive devices that are affordable and match to their needs, in line with the United Nations Universal Declaration of Human Rights (UDHR) (Stein et al. 2007). In particular, the right for individuals with special needs to access the fundamental human rights identified in the UDHR, such as the right to not be subjected to degrading treatment, the right to work, and the right to access education, may be protected through the provision of assistive devices.

2.8.3 Mainstream assistive devices

An important development is that mainstream technologies, such as smartphones and computers as effective tools offer features that allow them to function as assistive products (Emiliani 2006). This has opened a whole new market of applications and other digital products developed for individuals with special needs. This includes navigation support applications for visually impaired persons, speech-operated environmental control systems that run on a smartphone, and

augmentative and alternative communication applications (UN General Assembly 2006). These applications have the potential to become available to large user groups at very low prices, although buying mainstream technologies is often not within reach of individuals with special needs.

Hemmingsson, Lidström, and Nygård (2009) claim that the use of mainstream technologies as a generic platform for specific assistive products and services should be strongly encouraged. A specific area that deserves attention is that of self-provision. Very often people develop assistive products themselves with very simple and cheap means. Such products can be very effective. It would be worthwhile to disseminate information about such cheap solutions and to develop guidelines/tips for making them (Cook and Polgar 2014). This might contribute to a more accessible provision system for individuals with special needs.

2.9 National policy framework

The National Plan for Higher Education is concerned with providing guidelines for higher education transformation (Department of Education, White Paper 6, Special Needs Education, 2001). The document emphasizes the importance of infrastructure in higher education in meeting the needs of students with special needs. The Ministry has acknowledged that all institutions will be able to fully address all infrastructural needs for students with special needs. Institutions within regions were allowed to develop regional strategies to ensure that students with special needs are well served across the region. This also called for all institutions to have a basic infrastructure that allows students with special needs to attend (Department of Education, White Paper 6, Special Needs Education, 2001).

The Department of Education strives to improve the infrastructure in higher educational institutions in all of its regions as much as possible (Jacobs and Govender 2020). Because the Department of Education wanted to ensure that the needs of students with special needs were met, more opportunities for students with special needs to study in universities and further their studies were created. Most importantly, it was to ensure that all campuses had basic infrastructure that allowed all students with special needs to access universities (Table 2004). It was recommended that higher education institutions should develop a three-year strategic plan to address infrastructure issues and ensure that the institutional infrastructure is accessible to all students with special needs, staff members, and the broader community (Department of Education White Paper

6, Special Needs Education, 2001). A three-year plan developed by higher education institutions will aid in monitoring and evaluating progress toward creating an inclusive environment.

To ensure quality education and support in special school resource Centers, support programs should address issues that include individuals with special needs from different socioeconomic backgrounds. According to Mthethwa (2017), one of the support offices at UKZN that serves as a support structure for students with special needs is the Disability Unit. At the UKZN PMB campus, the disability unit is located at the main campus (house 2). In this campus, the disability unit plays an important role in providing students with the proper accommodation means. According to the Department of Education, White Paper 6, Special Needs Education (2001) there is a need to establish support teams at the higher education level. These teams' primary function will be to implement properly coordinated learner and educator support services. These services will aid in the learning and teaching process by identifying and addressing the needs of learners, educators, and institutions".

2.10 Ethical implications

The cost and affordability of assistive devices create a number of challenges if individuals with special needs are not accommodated (Ismaili & Ibrahimi, 2007). People with different special needs who cannot afford the devices are forced to withdraw from their societies. This leads to exclusion and a sense of alienation from other members of society. Furthermore, according to World Health Organization (2022) individuals with special needs face many ethical concerns, such as unemployment, assistive device pricing, a lack of service providers for assistive devices, and being forced to be dependent. To make sure that individual with special visual needs have the dignity and freedom they deserve, proper production and supply of assistive devices must be implemented.

Pal et al., (2011) state that “although assistive devices bring great promises for preserving the independence of people with special needs and changing their life for the better”, the use of assistive technology has a significant role in dealing with social exclusion which plays an essential role to the independence of people with special needs (World Health Organisation 2022). WHO (2022) state that assistive devices, in particular, may pose new risks, undermining a person's autonomy and independence. These Assistive devices may perpetuate a dependency culture if assistive devices, such as robots for people with special needs. “The use of algorithms embedded

within assistive devices may limit autonomous decision-making" (Khalil & Hantira 2022).

World Health Organisation (2022) argues that assistive devices may perpetuate the perception that some individuals with special visual needs can be dependent on a certain device. For example, a person who wears glasses may find it difficult to function without them. However, this can have an adverse effect on eye pressure and vision, lowering self-esteem, increasing dependency, and exacerbating their problems. Ismaili and Ibrahimi (2017) mention the four concerns about autonomy which includes issues of privacy, control delegation, accountability, and social compatibility which raise concerns about the ethical reliability of assistive devices. Assistive devices may collect a large amount of data about their users, including personal information, habits, and preferences. This raises concerns about the possibility of sensitive data being misused or accessed unauthorizedly. User data storage and transmission can be vulnerable to breaches, hacking, or unauthorized access, potentially jeopardizing users' privacy, and confidentiality.

As people become more reliant on assistive devices, they risk losing self-reliance and essential skills or capabilities, potentially leading to a loss of autonomy. Assistive devices that make decisions on users' behalf raise concerns about who has ultimate control and the potential for devices to act against users' desires or best interests. There is concern that assistive devices may not sufficiently empower users to actively participate in decision-making processes, potentially leading to a loss of personal agency and self-determination. If assistive devices fail or provide incorrect information, users may face serious consequences. The issue of accountability arises as to who is accountable for the actions or outcomes that result from such malfunctions. Assistive technology frequently relies on complex algorithms that can be biased, resulting in unequal treatment or unfair outcomes for certain individuals or groups. Holding the developers and maintainers of these algorithms accountable becomes critical in addressing such biases.

Finally, "a human rights approach provides a useful lens through which to evaluate the benefits and challenges of using assistive devices" (Bennett 2019:45). According to Bennett (2019:63) "a human right's method also serves as an important reminder that the rights and interests of people with special needs who use technology, as well as whether it will truly improve the lives of those who use it, must remain central to any assessment of the implications of the role of assistive devices." Furthermore, a "human rights approach must include a mechanism for translating 'concepts of rights and freedoms into effective policies, practices, and practical realities'"

(Australian Human Rights Commission 2018). However, Vaidya (2016) states that it is disappointing that the dignity and human rights of people with different special needs are sometimes not respected.

2.11 Summary

This chapter has examined important literature on the effect of assistive tools on people with special visual needs and its ethical implications. As an ethics student, the researcher discussed ethics studies on special needs framework and the impact of assistive devices. The chapter has also explored the different assistive devices and the impact in special education and how inclusive education is achieved. The chapter explored the different support systems and challenges of availability and affordability of assistive devices. This chapter has discussed the significance of assistive devices on students with special needs. Funding mechanisms, international and local standards and the CRPD have shown different factors have an impact on the assistive devices given to individuals with special needs. This chapter has also discussed the importance and benefits of inclusive education, as well as how UKZN strives to be as inclusive as possible. Students at the UKZN PMB Campus, for example, are regularly assisted at the disability unit to apply for and receive assistive devices, ensuring that they are accommodated. The "UKZN policy" for students and staff with special needs, as well as national policies, have been discussed in this chapter.

Chapter 3

Theoretical framework

3.1 Introduction

A theory is developed to predict, explain, and understand ideas and to question and spread established information with the limits of the significant limiting assumptions. According to Claasens (2013:50) "a theoretical framework is the structure that can hold or support the theory of a research study." A theoretical structure theory also plays a role in explaining why a research issue occurs within the study and defines it. Mthethwa (2017:52) defined a theoretical framework as "a structure that guides research by relying on a formal theory constructed by using an established, coherent explanation of certain ideas and relationships". This dissertation is driven by four key theories that form its context. Humanitarian ethics, communitarian ethics, critical disability ethics and care ethics are the four fundamental theories that shape the context of this research.

The main purpose of concentrating on or selecting these theories is to help me understand and examine the diverse experiences of individuals with special needs in different communities as a marginalized group. These theories are normative ethical theories that claim that moral action, as a high moral standard, focuses on interpersonal relationships and care or benevolence. Noddings (2013) states that the theories contain three attributes that are part of the moral values of carefulness, care, and mindfulness. Being a marginalized community, the various experiences of individuals with special needs in various communities is important when taking into consideration their experiences with the use of assistive devices. Critical disability ethics has a unique perspective in viewing individuals with special visual needs. This theory appears to have provided a powerful framework for bringing individuals with special needs together in a common struggle for equality and rights.

By doing so, critical disability ethics has promoted the idea that individuals with special needs should be actors in their own lives rather than passive recipients of care (Albert 2014:4). This study will provide a review of the charity model and the medical model. The argument in this study is that these models do not have a holistic view of understanding individuals with special visual needs. According to Junction (2011), the charity model presents an individual with a special need as not being able to be independent as other members of the society. However, independence can

be expressed in different ways, but it does not imply that individuals with special needs are not capable of clearly expressing their independence in their societies.

The medical model, on the other hand, according to Sullivan (2011), defines an individual with a special need as suffering from a certain type of illness or medical condition. This representation tends to disempower individuals with special needs, as the medical diagnosis is used as a tool that control their right of access to equal benefits and privileges with people without special needs. The medical model is underpinned by an ideology of excluding individuals with special needs based on their perceived health status. As a result, Yeo (2005:6) states that "any discussion on individuals with special needs had been focused either on medical 'cures' or, where cures were not forthcoming, on pity and charitable donations. Both of these approaches (e.g., the charity and medical model) present the individuals with special needs as the 'problem".

This chapter will critically examine and discussed the key four theories that play an important role in this dissertation. The chapter explores how the theoretical framework can play a role in better understanding how to create opportunity for equality for all and how the life of individuals with special needs can be improved. It will also discover what impact can be caused by assistive devices in order to create a fair society that does not exclude individuals with special needs. This study also provides a critic of the charity and medical model.

3.2 Critical Disability Ethics,

According to Meekosha and Shuttleworth (2009); Vehmas and Watson (2014), critical disability study encompasses a wide range of interdisciplinary approaches to the study of individuals with special needs. Critical disability study understands individuals with special needs as a cultural, historical, relative, social, and political phenomenon. The term "critical disability study theory" is used here to encompass a broader range of approaches, including those that stem from the study of ethics. According to Schalk (2017), the theory entails a critical examination of individuals with special needs and the social norms that classify certain characteristics as impairments.

Critical disability theorists orient their work toward activism and do not intend that their ideas be confined to the academia. As a result, Goodley, Liddiard, & Runswick Cole (2018: 206) and Meekosha & Shuttleworth (2009: 48) state that scholars should concentrate on social justice and accommodation methods, as well as working in solidarity with individuals with special needs for the sake of liberation. Critical disability studies, according to Hamraie (2016), is an emancipatory

model and it involves discourse. It ensures that the ideas that are relevant play a role in understanding and analyzing the society.

Scholars employ Critical Disability theory to both characterize socio-political constructions of individuals with special needs and track the repercussions of these constructions on marginalized individuals. Through critical disability ethics, I aim to relate to lived experiences and attempt to change the way individuals with special needs are understood. This is due to the fact that critical disability theory takes the history and the creation of the identity of people with special needs seriously. The identity is the uniqueness of individuals with special needs and realizing their role in societies. Furthermore, according to Shildrick (2007:233), "Critical disability study is substantially linked with a post-conventional theoretical approach." It aims to build on and analyze the achievements of working via more modernist disability paradigms, such as the social constructionist model. Through the use of critical disability studies, I also aim to represent a shift away from binary understandings such as the social vs medical paradigm and disability vs impairment.

Ellis et al. (2018) claim that Critical disability theory is able to challenge traditional disability studies and engage in transformative, intersectional, and coalitional critical work. Critical theory identifies, describes, and analyzes the included or hidden origins of social and political culture, discourses, and institutions. Diverse critical theories unite in the sense that they target ideology, distrust appearances, and often point out false consciousness. Critical disability theory thus allies itself with Continental philosophical methods, including phenomenology, Freudian psychoanalysis, and neo-Marxist approaches (Kearney & Rainwater 1996: 195). Under this approach, critical theory finds that meaning has social origins, often from "historical strategies of domination and liberation".

Critical theory challenges cultural institutions which undergird feasible practices of exclusion and misrepresentation. Critical social theory also engages in dialogue among cultures. This call for an explicit dialogue with human rights agencies and emancipatory thinking from the diversity of cultures and societies. The framing of critical disability theory within different societies partially sets its agenda and opens out to fresh methodologies. According to Thomson (2002), critical disability theory and feminist theory are linked and can drive an integrated feminist-special needs analysis.

The benefits of critical disability theory, however, are not only limited to the study of individuals with special needs. Critical disability theory offers crucial resources to other analyses, including but not limited to those conducted in feminist philosophy and philosophy in general. Thomson (2002: 2–3) state that feminist theory needs disability analysis in order to achieve its own goals, and, again, it is best to unite the two through common critical theory strategies. For Thomson (2002) without critical disability studies, feminism cannot critically tackle problems like infanticide, selective abortion, eugenic programs, coercive rehabilitation, genocide, and normalizing surgical procedures, among other. The use of critical disability studies provides a clear understanding and analysis of the issues that feminism cannot clearly express. This claim proves that these issues are not limited to individuals with special needs.

Critical disability theory contributes to framing the understanding of individuals with special needs in a broad range of ways. Tremain (2017) states that critical disability theory challenges the marginalization of the study of individuals with special needs and its ghettoization within bioethics (and its circumscription, thereby, to the medical model). Critical disability theory is significantly aimed toward exposing and analyzing the plight of persons with special needs and consequently offers a critical evaluation (Mollow 2017: 340). Furthermore, critical disability studies largely focus on achieving social and political inclusion for individuals with special needs so that they are properly accommodated. To that end, work done under the implementation of critical disability studies often uses the language of civil rights, minority politics, and liberal justice frameworks. According to Meekosha and Shuttleworth (2009: 49) "critical disability studies' project is to create inclusion for individuals with special needs back into the daily activities of the society as full citizens whose rights and privileges are intact and whose history and contributions are recorded."

Tremain (2005) brings together interdisciplinary, international work on individuals with special needs "from a variety of theorists who use Foucauldian approaches". Tremain (2005:28) claims that "the collection is a response to Foucault's call to question what has been regarded as natural, inevitable, ethical, and liberating. Hence, contributions to that collection draw on Foucault in order to scrutinize a range of widely endorsed practices and ideas surrounding individuals with special needs, including community care, inclusion, accommodation, and special education". In this study, I critically analyze the term critical disability theory. I argue that the social understanding embedded in the term disability is not appropriate in the academic space. I aim to undermine,

revisit and challenge terminologies like “people with disabilities”, handicap and crippled that are sometimes used.

3.3 Humanitarian Ethics

Karl Marx sees a just society through his humanitarian beliefs. The uniting and revolution of the downtrodden against their oppressor was the only way for Marx to interpret a just society, the building stones of a sturdy foundation. Brauman (2001) state that the sturdy foundation attempts to interpret the construction of a truly Democratic society, one based on the morality of an equitable society, as best articulated through the realization of a communist society built on a classless foundation.

Humanitarian ethics has evolved into the moral foundation that guides many humanitarian organizations' attitudes and lifestyles. In a crisis, however, Koulikourdi (2008) argue that humanitarian principles are not always shared by all parties. The scope and nature of the societal issues that humanitarians seek to address are always changing, making creativity a critical core ability. Humanitarians' ability to adapt and respond necessitates the development of new ideas, including new methods of engaging with and relating to those they wish to assist. To sustain and promote these new methods of working in today's societies, a societal culture that values diversity and inclusion is required. Moreover, according to Slim (2016), humanitarianism is concerned with the value of every life. The values of human life are crucial in the development of a society that accommodates and protects life. Hence, it is important for the society to understand individuals with special needs and respect them.

Brandt and Gardner (2000) argue that humanitarian ethics has evolved as a principle-based ethics based on the concepts of humanism, impartiality, neutrality, and independence designed to govern the provision of humanitarian help and protection. Humanism is a philosophy that stresses the importance of human factors rather than looking at religious, divine, or spiritual matters. Brandt and Gardner (2000) state that humanism is rooted in the idea that people have an ethical responsibility to lead lives that are personally fulfilling while at the same time contributing to the greater good for all people. Humanism stresses the importance of human values and dignity. It proposes that people can resolve problems through the use of science and reason. Rather than looking to religious traditions, humanism instead focuses on helping people live well, achieve personal growth, and make the world a better place. Gorgon and Donini (2015:89) explain that

“impartiality includes the values that decisions must be based on objective criteria, rather than on the basis of bias.” This means that decisions should be reasonable and not favor some individuals. This is ethically correct as decisions will be fair and equal. Bookstein (2000) supports these values by stating that existing frameworks for humanitarian ethics must be enhanced to allow personnel and organizations to manage the digital age's unique problems and opportunities. Furthermore, the social benefits of a diverse and inclusive social environment are clear, particularly when it comes to assisting individuals with special visual needs in their inclusion.

According to Brauman (2001:21) “humanitarianism is a broad commitment to and belief in the intrinsic worth of human life.” Despite the lack of a universally accepted definition, Clark (2012) states that humanitarianism is a basic ethical principle that cuts across cultures and time. Humanitarianism sometimes refers to a more precise approach to a disaster. Bernard (2015) claims that humanitarianism is a systemic reaction to crises that addresses the needs of those afflicted by conflict, natural disasters, epidemics, and starvation. Clark (2012) also adds that the focus of humanitarianism in the times of crises is, to varied degrees, on fundamental or immediate needs for assistance and protection. Moreover, it is also beneficial to have a holistic approach to diversity and inclusion work that supports different experiences beyond depending on the society. This requires paying attention not just to societal help, but also to the aid or developments brought about by assistive devices that are beneficial to people with special needs. Building empathy and relationships as ends in themselves, rather than as a means to an end, and displaying sensitivity and emotion in day-to-day social interaction, are especially important for promoting diversity and inclusion among various segments of society.

Putting diversity and inclusion at the forefront of social interaction requires the bravery and confidence to leverage assistive technology, experiences, and identities to promote innovation and inclusion. Lie (2020) states that the social benefits of a diverse and inclusive social environment are enormous, especially when a significant role is created for those with special needs. Humanitarians play an important role in promoting social good and are motivated by both the successes of diversity and inclusion and the advancement of fairness and equality that they symbolize. Global organizations that transcend global hierarchies to reflect the full range of human experience and perspectives can assist societies in better understanding difficulties and improving collective engagements to design and implement solutions.

3.4 Communitarian ethics

The ideology of communitarianism was introduced by John Goodwyn Barmby a British Chartist leader (Maher 2002). Maher (2002) states that communitarianism is a theory that emphasizes the individual's connection to the larger community. Its basic idea is founded on the belief that a person's social identity and personality are mostly shaped by communal ties, with individuality receiving a lesser degree of emphasis. Communitarianism, according to Amitai Etzioni (1996), is "a social ideology that emphasis the values of the society in expressing the good." Liberalism and communitarianism maintain that a person must do morally right actions on his or her own capacity (Etzioni 1996). According to Farmer (2003), the methods in which common ideas of the good are generated, conveyed, justified, and reinforced are examined by communitarians.

According to Leeder (2004:55), "communitarianism is the belief that different forms of constitutive communities (or social relations) shape our identities in significant ways, and that this understanding of human nature should drive our moral and political judgements, as well as policies and institutions." In this way, communitarian ethics plays an important role in understanding how societies operate. According to Emerald (2023) this includes understanding the experiences of individuals with different special needs in the changing modern world. Different societies function and believe in different values which also creates a change on how individuals with special needs are supported and accommodated.

Communitarianism is an ethical viewpoint that aligns agreeably with the fundamental principles of what public relations is all about: building and maintaining relationships. Amati Etzioni (1996:11), one of the founders of the communitarian movement, opines that communitarianism is "an environmental movement dedicated to the enhancement of our moral, social, and political environment". Communitarians are committed to working with their neighbors to effect the changes in values, practices, and public policies that will enable us to accomplish for society what the environmental movement aspires to achieve for nature. This movement attempts to protect and improve the lives of people with special needs.

Communitarianism opposes the values with rights, interests, including goals that are outside of social context and instead asserts that people have duties and responsibilities as citizens. According to Farmer (2003) communitarianism shares characteristics with deontology, utilitarianism, and

feminism. These characteristics include taking into consideration the shared relations within the society and the different morals that affect different people. A communitarian public relations ethic would compel society to behave in the best interests of people with special needs. By this, the society will be more aware and create a more inclusive environment that properly accommodate individuals with special needs. In shaping and assessing cultures, the communitarian would emphasize on collaboration rather than competition. Fry et al., (2004:67) state that "communitarianism is a sociopolitical ideology that values the needs or common good of individuals with special needs and other members of society." Moreover, "communitarianism is also considered the polar opposite of liberalism since it prioritizes the interests of society over the interests of individual citizens."

According to Adams and Brown (2006:28) "Ferdinand Tönnies, Amitai Etzioni, and Dorothy Day played an important role in developing the concept of communitarianism throughout the twentieth century." Communitarianism emphasizes each individual's obligation in serving the community's "common good" and the social value of the family unit. Adams and Brown (2006) states that community interactions and contributions to the common good determine each person's social identity and sense of place within the community more than individual rights. According to Etzioni (2003), authoritarian communitarians emerged in the early 1980s and advocate for prioritizing the common good of the community over the "autonomy and individual rights of the people." Furthermore, Munung et al., (2021) claim that the doctrine of authoritarian communitarianism reflected, in many ways, the social practices of East Asian authoritarian societies such as China, Singapore, and Malaysia, in which individuals were expected to find ultimate meaning in life through their contributions to the common good of the society.

In comparison with authoritarian communitarianism, Etzioni (2011) argues that responsive communitarianism seeks a more deliberately designed balance between individual rights and social responsibility to the common welfare of society. In this way, responsive communitarianism emphasizes that individual liberties are accompanied with individual duties, and that neither should be overlooked in order to accommodate the other. According to Chua (2000) modern responsive communitarian ideology claims that individual liberties can only be safeguarded through the maintenance of a civil society in which individuals respect and protect their own rights as well as the rights of others.

3.5 Care ethics

The ethics of care expresses the importance of “morality and normative ethical theory” in relation to the values that are shared in communities. The values that are shared in different communities significantly affect individuals with special visual needs. The values of care ensure that individuals with special needs are treated with the support they deserve. The ethics of care represent ethical theories that highlight moral actions such as treating equally students with special visual needs, ensuring their safety and privacy and not harming them in any way. These moral actions play an important role in ensuring that individuals with special visual needs receives happiness or moral justice. Although people justify and understand moral actions differently.

The word 'care ethics' is rooted in feminist philosophy and was first introduced by Carol Gilligan, a psychologist. According to Gilligan (1993), the term was developed after a report about how little girls look at values of the society. In comparison to boys, Gilligan found that girls' moral growth appeared to come from sympathy rather than being focused on justice. From the report, Gilligan suggested that instead of stressing autonomy and laws, ethics should concentrate on relationships. Her philosophy concentrated more on our relationships with each other and circumstances being context based. Relationships should be harmonious, peaceful and supportive in order to be maintained and healthy. This is important in understanding the kind of relationships linked to individuals with special visual needs. Nel Noddings also contributed further to the theory of care ethics. Noddings (2013) felt it was important to distinguish between “natural care or wanting to care and ethical care or needing to care.” Natural care or wanting to care involves individuals with close relationships, on the other hand, ethics of care or needing to care involves taking into consideration the values and morals of the society while showing care. Individuals with special visual needs require the values of care ethics in order to better survive in their different communities. In modern times, a variety of different situations have been applied to care ethics. In addition, care ethics includes ethics for industry, ethics for the environment, and even ethics for animal care. Bioethics is one of the best examples of care ethics being used in modern times. In particular occupations involved in medicine deal with caring for others. As a result, Tire (2003) claims that the ethics of care have become part of the assessment of all medical procedures and policies. It has also been extended to a variety of different social movements. The discussion on capital punishment, hospice care, and individuals with special visual needs has included the ethics of care.

Noddings (2013) also provided a comprehensive observation of care ethics that caring involves the values of morality. Noddings (2013) viewed the interactions as ontological. This is where identity is understood by the series of interaction that people have among each other. The kind of interactions the society ~~has~~ towards individuals with special visual needs play a role in ensuring that they are part of the society. By this, the interactions require more support and peace which is part of the care provided. Noddings (2013) claims that caring is ethically fundamental to human being by suggesting that caring is a common human attribute. Thus, the ethics of care is particularly important for human relationships, especially when it concerns persons with special needs. What is distinctive in all such relations, however, is that the one caring acts on the part of the cared for in response to a presided dived need. In this study, it is individuals without special needs and individuals with special visual needs that live together in the different communities. The care provided to individuals with special visual needs by other individuals impact the accommodation and ethical implications faced by individuals with special visual needs. Such caring relationship apply to both natural caring, which is caring borne of inclination and love for those close to the one-caring and ethical caring, which is the "I must" feeling reaction to the predicament of a person. Through this, the care provided to individuals with special visual needs includes ensuring that they have access to proper assistive devices and understanding their different challenges.

According to Noddings (2013) “ethics of care is a natural outgrowth of natural care.” Even with those with whom one has no caring relationship, complete strangers, natural caring memories arise, generating the "I have to do something" duty. In anyone who aspires to a sense of self as a moral, caring person, this impulse is compulsory. According to Tire (2003) for such a duty to have force, “two criteria must be taken into consideration.” The relationship with the other person must exist (or have the potential to exist), and the relationship must have the potentiality to grow into a relationship that is mutual caring.

One does not have either the ability or the obligation to look after everyone. According to Walker and Hennig (2004), a caring morality has three levels: care for the self at the expense of the other, care for the other at the expense of the self, and care for moral maturity when the needs of the self and the other are understood.

Care ethics requests society to reconsider decisions not in terms of rigid norms, but in terms of how they may affect the people with whom we share our lives. An ethics of care humanizes moral decisions, but it rejects egocentrism and ethnocentrism. Moral decisions include how students with

special visual needs interact and live with other students. Moral decisions also represent the moral code that guides the decisions of different students and how they integrate throughout their university life. The idea of a moral code extends beyond the individual to include what is determined to be right, and wrong, towards students with special visual needs or the wider university at large. Moral decisions are conceptualized as a more mature, socialized form of perceiving in which the individual can understand another person because he/she sees the facts as they appear to the other.

Egocentrism and ethnocentrism are considered as cognitive biases which foster violence at both individual and group levels. Each is characterized as a lack of empathy or an inability to see reality as it appears to others.

Care is indeed associated with the normative value of avoiding or causing harm, but it also simply a realistic commitment to proactively strive to prevent harm. As a result, it is vital that assistive devices benefit individuals with special needs while also safeguard them from injuries. According to Leonardi, Bickenbach, Ustun, Kostanjsek, and Chatterji (2006) the normative value of care is linked to the ideal of contributing to the promotion of good but avoid self-sacrifice or the sacrifice of a third party's well-being. Thus, it is morally right for the students to treat each other with care and respect. Students with special visual needs may require a lot of support in their academics from time to time and it should be great if other students took this into consideration.

3.6 Beneficence and non-maleficence

According to Noddings (2013), care, the normative core of care ethics, can be portrayed as a merging of the non-maleficence principle when it is extended to enable specific sorts of interventions with the beneficence principle. Non-maleficence is commonly defined as refraining from causing harm to others, however the normative ideal of care entails more than just refraining from harm, and it often includes active intervention. The first commitment is comparable to the non-maleficence principle, while the second is related to the beneficence principle. These two important principles will be discussed more in detail below to show how they can apply to the life of individuals with special visual needs. There are also important discrepancies between these two normative principles and care when it comes to individuals with special visual needs.

Aksoy and Tenik (2002) state that the beneficent and maleficent ideals are vital in ensuring justice

and the greater good. Most moral theories have adopted various parts of beneficence, and utilitarian theorists consider beneficence as the foundation for maximizing benefit to all. Humanism is included in modern ideas on beneficence in the context of health care and the life of individuals with special visual needs. Khan (2017) argues that everyone has unquestionable rights to life and liberty, which must be cherished, nurtured, and aided. These rights include the right to health care and education. Ensuring these rights plays an important role in ensuring proper accommodation measures. Beneficence and non-maleficence principles are in humanism and effectively include all values that have an impact on different individuals, dispositions, and actions with the goal of benefiting individuals with special needs.

Furthermore, Akapi (2020) states that the language of the principle or rule of non-maleficence refers to a normative statement of a moral obligation to act for the others' benefit, helping them to further their important and legitimate interests, often by preventing or removing possible harms. It is important that the society plays a role in designing assistive devices that will improve and make sure that it is easy for individuals with special visual needs to access public infrastructure. The society can play a role by actively involving individuals with special needs in discussions and innovation strategies about assistive devices. This method will ensure that individuals with special needs are not left out and the gaps will be easily identified. Engaging individual with special needs at the designing state of assistive devices will ensure that they are not viewed merely as receivers of sympathy but involved members and clients.

In contrast to actions or policies that benefit others, Mendola (2006) claims that benevolence refers to the values or virtue of being disposed to act in the interest of others. These values play an important role in understanding the support provided to individuals with special visual needs. In morality or ethics, beneficence principles establish moral duty or values that are important. On the other hand, Shaw (2006) states that beneficent actions can be carried out based on nonobligatory, optional moral ideals, which are norms of a morality of commendable determination. These moral ideals shape how students with special visual needs are treated and understood to improve their life. The moral actions can be used to better accommodate and ensure that the needs of individuals with special visual needs are clearly met. Exceptional beneficence is also an important moral value, this means that it is generally classified as supererogatory, which means going above and beyond the call of duty or doing more than is required.

According to Aksoy and Tenik (2002) this type of remarkable behavior is frequently associated with good values and morals, “it also ties to virtues and Aristotelian ideals of moral excellence.” According to Khan (2017) such actions and moral quality of character do not have to attain to the level of moral saint or moral hero. Moral perfection is achieved in stages, and not all supererogatory acts of beneficence or benevolent dispositions are extraordinarily difficult, costly, or perilous. Moreover, Akapi (2010) states that ordinary morality does not need beneficent deeds involving tremendous sacrifice or maximal compassion. For example, a doctor putting herself in a potentially lethal position during an epidemic to provide medical care in the lack of protective drugs and equipment. Such unusually beneficial activity is frequently driven by moral aims rather than duty standards, but the line between obligations of beneficence and ideals of beneficence is occasionally blurred.

Mill (2006) argues that the utilitarian principle has left a trail of unconvincing and incompatible ideas that may be logically unified by a single criterion of beneficence that permits us to distinguish objectively what is right and wrong. He declares the utility principle, or the "maximum happiness" principle, to be the fundamental underpinning of morals actions are right in proportion to how they promote happiness for all human beings, and wrong in proportion to how they generate the opposite. This is an important beneficence principle, but it has the potential to be highly demanding. According to Mill (2006) actions or practices are right if they result in the greatest possible balance of beneficence or pleasure. Providing proper assistive devices at affordable costs needs to maximize pleasure to individuals with special visual needs. Mill (2006) also believes that the conceptions of duty, obligation, and right are subjugated to and defined by what maximizes advantages while minimizing negative results.

The most pleasurable outcomes can be used to calculate pleasure or maximization. If an action is to maximize pleasure, it must be capable of maximizing happiness or joy. According to Jeremy Bentham (1989:12), “moral actions should be determined how it maximizes pleasure.” If the provision of assistive devices will assist and improve students with special visual needs at the university ~~then~~ it should be motivated that they are provided. Jeremy Bentham (1989) claims that goals should be to achieve the greatest happiness for the greatest number. The aim is that assistive devices more especially should lead to a more accessible environment that individuals with special visual needs can live and do things. Bentham (1989) defined happiness in relations to right actions "the sum of pleasures and pains." "Utilitarianism" due to its focus on the utility of the consequences

of behaviors mainly focuses on right actions and happiness. Happiness promotion is compatible with other ideals because it necessitates values and freedom, and it focuses on happiness. The principle of beneficence cannot be equated with utilitarianism because of the difficulty of measuring happiness.

On the other hand, a commitment to considering human beings in terms of their intrinsic worth is required to understand the concept of human dignity or worth. According to Apel (1984) the transcendental perspective asserts that all human beings are intrinsically valuable, including those with intellectual disabilities and special needs. Additionally, the transcendental conception suggests that worth is a conditional quality. There are no abilities, characteristics, or cycles that one ought to follow before one can be qualified for inherent qualities. Because this intrinsic worth is unique to each individual, it indicates that each human being is intrinsically valuable. There is no human being who is superior to anyone else. Every human being deserves to be treated as an end in itself, not as a means to an end. Individuals should not be viewed or treated solely as instruments or objects of the will of others, but rather with respect for their intrinsic worth.

Because moral rightness is established by goodness, which is viewed in terms of individual well-being, Mill's moral theory is fundamentally welfare oriented. It is a consequentialist theory since activities' moral rightness and necessity are decided by their beneficial results. It is an aggregative theory because a decision on suitable or essential behavior is based on an evaluation of the effects of all alternative actions on the welfare of all affected parties, which needs combining positive and negative effects across all affected individuals. Beneficence has rarely had such a prominent role in moral theory (Mill 2006).

3.7 Criticisms of the charity and medical model theories

During the Middle Ages, the charity model of disability was the first paradigm used to explain persons with impairments (Griffo 2014). This special-needs paradigm is still utilized in numerous social and cultural settings to try to comprehend individuals with special needs, and the majority of individuals with special needs believe that the charity model is not appropriate and does not clearly represent them. Griffo (2014:148) argues that the charity model of special needs, which stems from the Middle Ages and continues to exist in many social and cultural contexts today has interpreted the status of individuals with special needs within a context of poverty, family abandonment, and social fragility. Individuals with special needs were and

continue to be perceived as less fortunate, pitied, and often rejected by their family members, relatives, neighbors, and communities within the context of the charity model. The charity model regards individuals with special needs as hopeless beings with little chance of improving their lives.

As a result, individuals without special needs have a propensity to undervalue individuals with special needs in terms of their human capabilities. Some individuals may believe that individuals with special needs are incapable of being well-educated or of working to support themselves. Slorach (2011) and Yeo (2005) agree with Griffo (2014) on the model's ideas. Individuals with special needs are generally discriminated against under the charity model, and their human rights are ignored or devalued by social actors and numerous organizations in society. Individuals with special needs are viewed as passive objects in society rather than social actors. Images of individuals with special needs as pitiful continue to be still prevalent, as they are most common in charity advertising. Furthermore, Dewsbury et al. (2011:104) argue that despite passionate complaints from organizations representing individuals with special needs, many charities continue to exploit them. Others emphasize an individual's "courage and bravery" as a "super cripple".

The charity model's portrayal of individuals with special needs as passive, undervalued objects contribute to policies that exclude individuals with special needs from mainstream social arrangements, public service, education, and work (Junction 2011:20). By emphasizing on the impairment rather than the person's potential, critics perceive this approach as incapacitating people and the source of much discrimination against individuals with special needs. Furthermore, Withers (2012) makes an essential criticism of the charity model in its goal of eliciting sympathy, ensuring that no genuine change occurs in the lives of individuals with special needs. The charity approach appears to revolve entirely upon non-special needs individuals doing good for individuals with special needs.

The medical model requires individuals with special needs to make an extra effort in order for them to be fully involved in mainstream society. According to Lang (2000), the discriminatory approach promotes the idea that individuals with special needs are innately less valuable as a result of being limited. However, this is a great concern to the human society as it gives rise to more biased viewpoints and consequently promotes exclusion of persons

with special needs.

Reiser (2006), states that the medical model of special needs sees an individual with a special need as having something wrong or lacking in their bodily parts that must be "fixed" in order for them to "fit in" with the rest of the society. The paradigm is based on the assumption that an individual with special needs appears to be different from socially set norms and requires changes to fit into society (Haughes, 2000). Such judgments reduce a person's self-esteem, and the individuals perceive themselves as being unacceptable in their society. Such judgements also continue to create the different inequalities and challenges faced by individuals with special needs. Lang (2000) explains that the medical model has established that individuals with special needs are biologically and psychologically inferior to non-special needs individuals. Individuals with special visual needs are considered incapable of exercising their own autonomy in decision-making and dealing with the different social challenges.

Individuals with special needs are expected to accept whatever non-special needs tell them, especially non-special needs medical experts. Such attitudes are concerning for individuals with special needs because they limit their ability to grow and develop in life. The paradigm does not permit self-direction, self-determination, or the inclusion of individuals with special needs. Furthermore, the medical model's picture of individuals with special needs has been widely disseminated in the media, contributing to discrimination against individuals with special needs. Sullivan (2011) argues that the media can even go so far as to indicate that the life of individuals with special needs is flawed which is an extreme case of medical model beliefs. Such a portrayal instills in society the notion that individuals with special needs are useless or destitute. This media’s perception adds to the unfavorable assumptions about individuals with special needs, affecting their confidence and ability to exercise autonomy (Tierney et al., 1988).

Previous special needs models were based on the idea that individuals with special needs are helpless and reliant on others. This study suggests the use of the inclusive approach which focuses on empowering individuals with special needs. Individuals with special needs can obtain autonomy through empowerment and a society that does not exclude them. Self-government or self-determination are examples of autonomy (Friedman 1997). According to Terzi (2004), the inclusive approach advocates for individuals with special needs’ full inclusion in society and acceptance as citizens with equal entitlements, rights, and obligations. The aim of an inclusive

education environment is to ensure that all students are treated fairly and get equal opportunities. Within an inclusive education environment, student diversity and uniqueness should be celebrated without discrimination.

The special needs inclusive strategy is portrayed as a significant weapon in the special-needs movement and in the lives of individuals with special needs. If applied correctly, the inclusive approach of special needs has the potential to become a tool of justice and freedom for individuals with special needs throughout the world (Swain et al. 2004). UKZN has introduced the inclusive approach to learning as it accommodates students with special needs on the UKZN PMB campus. Students with special visual needs can build self-esteem and become economically and socially active and independent if inclusive approach is adequately applied.

3.8 Summary

Because there are inherent distinctions in society and the economy, private and public sectors must also play a role. The concept of equal accommodation, which plays a role in guaranteeing fair treatment, is inextricably tied to care ideals and is especially pertinent in the context of special needs framework. Furthermore, to encourage all people to participate and enjoy all of their rights equitably, society must often make positive effort that may be tough or costly. It should ensure that individuals are not pushed to the outskirts of society because they do not meet or adhere to social standards. The theoretical structure of humanitarian ethics, communitarian ethics, critical disability ethics and care ethics have been examined and discussed in this chapter. The chapter has explored how such ideas play a part in narrating the effect of assistive tools on students with special needs.

By using the four theories, the chapter explored the treatment and accommodation provided to individuals with special needs. This chapter provides a critique of two special needs models: the charity model and the medical model. The charity model of special needs asserts that individuals with special needs should be pitied and helped since society regards them as helpless and in need. The charity model makes the person with a special need dependent on others rather than encouraging them to become self-reliant and independent. The medical model is considered as negative in its approach because it promotes negative self-identity by focusing on special physical needs. The medical model does not promote the need for modification in order for people with special to engage in society.

On the other hand, critical disability studies are an advancement in special needs studies since it emphasizes the environment as a limiting element. These special needs approach can be classified as emancipatory model, due to the fact that it emphasizes that individuals with special needs are perfectly capable of articulating their own experiences and of playing an active role in research about them. Finally, the critical disability studies and care ethics prioritize and respects the autonomy, agency, and human rights of individuals with special needs

Chapter 4

Method and methodology

4.1 Introduction

The method and methodology of the study are discussed in this chapter. This study used a qualitative research approach to collect and analyze data. According to Sally Hartley and Mohammad Muhit (2003), the qualitative approach is compatible with special needs studies. The qualitative method was used at the UKZN PMB Campus to investigate and comprehend the challenges and experiences faced by students who have special visual needs. As I stated in the previous chapters, understanding individuals in society and how they are affected by the modern world is critical. My motivation for supporting this statement is to capture and better understand the impact of assistive devices and the social experiences of people with special visual needs.

4.2 Qualitative Research

The research has employed a qualitative research approach to better comprehend the challenges and stories that are told by students with special visual needs and the role of assistive devices in ensuring an inclusive and conducive learning environment for them. The qualitative research method was used to investigate and narrate people's life experiences. A qualitative approach has the advantage of allowing students with special needs to share their personal challenges they have historically encountered in their various societies or institutions concerning the access and use of assistive devices.

According to Mthethwa (2017:72), "Qualitative research is distinguished by its goals, which are related to understanding some aspect of social life, and its methods, which (in general) generate words, rather than numbers, as data for analysis." The qualitative approach ensured that students with special visual needs to describe more broadly their own experiences while using the infrastructure at the university or in their communities. Furthermore, Mthethwa (2017) states that a qualitative approach allows participants to provide extensive data relevant to their specific contexts.

Mthethwa (2017) claims that the concept of qualitative approach allows researchers to see the world through the participants' perceptions and experiences. “Interpretivism has been known to promote the importance of qualitative data in pursuing knowledge” (Kaplan and Maxwell, 1994). The main aim of using qualitative research is to clearly explore people’s direct experiences rather

than making assumptions that are frequently incorrect. Some people without special needs, for example, may believe that people with special needs cannot be independent. However, people with special visual needs can live independently with the correct implementation and use of assistive devices.

Qualitative researchers can delve into the daily lives of people's experiences including students with special needs. As a result, qualitative research seeks to examine an entire situation in its natural setting to elicit the thoughts and feelings of those being interviewed (Mthethwa 2017). In this study, I demonstrate how students with special visual needs get used to different environment of learning, this includes a learning environment that involve a diverse group of students which require the full cooperation of a student with special needs. I do not intend to consider the cooperation of students without special needs as they are irrelevant in this study. Students with special needs in different institutions are expected to cover the same content as non-special needs students. In mainstream schools, such situations disadvantage students with special needs if no assistive devices are put in place. Such issues are best explored qualitatively to properly learn about the challenges and experience that students who have special visual needs face in their social and academic lives at university.

4.3 Narrative Research Approach

According to Clandinin ED (2006:55), "Narrative researchers share a common interest in the study of stories, narratives, or descriptions of a series of events." I believe that sharing stories is understanding different experiences of different people. However, what counts as a story, the types of stories they study, and the methods they use to study them all differ. According to Benson (2014), "narrative inquiry as an alternative approach to research in the humanities and social sciences has grown significantly in the last decade". Narrative research plays an essential role in storytelling and sharing different experiences. The storytelling is based on reality more than the assumptions about personal experiences. Narrative research also provides a detailed understanding of human interaction, the daily challenges, and social values that affect individuals with special needs.

One of the reasons I have used narrative research in this study is that it allowed individuals with special visual needs to share constructive and relevant experiences. This means that the collected

information in this study is significant towards creating awareness and covering the gaps. Another advantage of using narrative research in this study is that it is based on collaborative research. Collaborative research focuses on the distribution of fair power equally between the individual conducting the research and the participants. This study also uses a questionnaire to collect data from the participants, which does not disadvantage them.

In this case, the participants still narrate their experiences or clearly express their challenges also through an interview schedule. From understanding the stories of students with special visual needs, I have gained a clear understanding of their experiences at the UKZN PMB Campus. The method and the inquiry are always guided by theoretical literature, which also plays a role towards the methodology or an understanding of the experiences (Clandinin & Connelly 2000). Moreover, narrative experiences entail reconstructing a person's experience concerning another person and a social environment (Clandinin & Connelly 2000).

4.3.1 Desktop Research Approach

I have used desktop analysis when gathering qualitative information because it is an important data collection tool. I obtained a wide range of facts through desktop research by reviewing relevant literature. The researcher in this study gained a deep understanding of the experience of students who have special visual needs. This is attributed to the literature analysis in this study. Using the desktop research method, research focused on the experiences and concerns that were shared by students who have special visual needs at the national and local levels.

I used desktop analysis as part of this study to better understand the main impact of assistive devices on people with special visual needs, as well as the ethical implications. In this research conducted in 2022 and 2023, the desktop research methodology was an effective way of gaining a rich understanding of how individuals with special visual needs can address barriers in diverse populations. Furthermore, the online resources used for this dissertation played a role in creating a deep understanding of the different concepts and themes. For my research, I primarily used Google Scholar, Research Gate, and the UKZN library at the UKZN PMB campus.

As part of this dissertation, I used official archives that can be viewed online. White Papers, for example, focus on interventions implemented by introducing assistive devices and track the evolution of special needs policies in South Africa. These papers play an important role in identifying the different interventions which are essential in this study. While living in the UKZN

residence, where I spend the majority of my time, I was able to use online resources. All of these sources and materials describe the various experiences of people with special visual needs and the different assistive devices that they use. Furthermore, the documents used in this dissertation were all written and published in English. Because of the master's program's focus, English was chosen as the language for this dissertation. This saved a lot of time, as well as confusion and misinterpretation of the results.

4.4 Setting of the Study

The study was conducted and completed at the "UKZN PMB campus." The majority of students with special visual needs live on campus, making it easy to locate and interact with all participants. UKZN PMB students from all years of study participated in the research via online and in-person platforms. This made it easy to interview and interact with all of the participants. This research began in March 2022 and was completed by the end of the academic year 2023. This time frame ensures that the study is completed on time and correctly. Furthermore, the study is grounded in a social, economic, and ethical context that accommodates individuals with special visual needs. Social norms determine social context and how society functions concerning accommodating individuals with special visual needs.

4.5 Sampling

The sample size encompassed 20 students, both males and females. The participants consisted of eight males and 12 females. Students with special visual needs were better able to reflect on and recall their lived experiences, as well as how assistive devices affect their lives. This is because they were the only participants in the study which allowed them to clearly narrate their experiences. Face-to-face and online platform interviews were used because they were deemed appropriate data collection tools for gaining new insights into subjectivity and lived experiences. This study made use of questionnaires and Semi-structured interviews. The semi-structured interview comprised open-ended questions grouped into themes and analysis instructions.

4.6 Data Collection

This study used purposeful/judgmental sampling, a non-probability sampling technique. The participants for this study are chosen based on their ability to provide detailed information.

Understanding students' everyday realities and struggles was more critical in this study than simply looking at statistics. Participants include students from different levels of study, this included undergraduate and post graduate students, these students are registered for support with the DSU. The data was collected in a method that ensured the privacy and confidentiality of all students that participated in the research.

Students had the right whether to participate in the study or not, this meant that no participant was forced to participate in the study. All participants were given a consent form during each interview, assuring them of their privacy and confidentiality throughout the research procedure. The research has followed formal processes to ensure ethical clearance approval from “the University's Humanities and Social Sciences Research Ethics Committee (HSREC)”, this also included the permission from the office of the registrar and the disability support unit at the PMB campus.

4.6.1 Interview Questions and Interviews

In order to collect proper and efficient information in this study, it was important to use a semi-structured interview guide and a questionnaire. This was done to engage and for the participants to clearly narrate their experiences of using assistive devices. A semi-structured interview guide is suitable for collecting data in a qualitative research project and allows the researcher to be flexible. Thus, the interviews for this study were conducted in different locations. However, most of the interviews were conducted at the DSU LAN at the New Arts Building at the UKZN PMB campus. Some of the interviews with the female participants were conducted in their resident spaces as per their request. However, some interviews were conducted in the researcher's residence as there were also students who were interested in the study. These locations or spaces were suitable for the interviews as they were accessible for students that are registered with the DSU at any time.

The semi-structured interview guide allowed the students with special visual needs not to be limited in their answers. Thus, most interviews lasted between 30 to 40 minutes. It was important to inform the participants about the aim of the research, informed consent form, and that the interview was to be recorded.

4.6.2 Data Transcription and Analysis

Transcribing data in a research project can be difficult and time-consuming because it requires a significant amount of the researcher's time (Riessman 1993). However, this process can be

beneficial because the researcher is familiar with the data. Transcribing the data was one of this dissertation's most exciting parts. This is because I could comprehend the data and properly analyze the participants' experiences. Each interview took me between 60 and 120 minutes to transcribe. It was also exciting because I could transcribe all of the interviews on my own, which was beneficial to me. Transcribing the data also made it easier for me to make an analysis and identify the various themes.

I went through several stages during the data transcription and analysis process to ensure that I collected and analyzed the correct data. To begin, it was critical that I actively and repeatedly read through the data. I did this to identify the various themes and capture the information correctly. At this point, it was critical that I analyze the data to ensure that I only kept the relevant information. Secondly, it was important that I classify the data into different themes. Classifying the data made things easy for me as it was easy to understand and analyze the information. This also made sure that the classified themes corresponded with each other.

In the third stage, it was critical for me to categorize all similar themes and paste them into a document to be easily analyzed. Since the themes had enough data, it was simple to identify them. In the final stage, I had enough data which was easy for me to understand and analyze. Writing up the data collected and finishing the chapter was simple.

4.7 Validity and Reliability

According to Thomas (2010), validity is primarily used to validate data that has been collected and analyzed for it to be believed and trusted. Some elements are used in demonstrating validity, such as reliability, transferability, and conformability. According to Mthethwa (2017) reliability is one of the most critical aspects of establishing trustworthiness. "Reliability is defined as the confidence that can be placed in the truth of the research findings," writes Anney (2014: 276). Because the interviews were recorded and guided by the informed consent form and university policies, the findings of this study are reliable. All recorded interviews were transcribed and saved in a secure computer file protected with a password. Only the researcher and this research supervisor have access to this computer file.

This study draws from other sources to construct a literature review and theoretical framework. On the other hand, Mthethwa (2017:91) states “that the research objectives established the parameters for developing in-depth interview questions.” It is important to be aware of the

possibility of bias, as the research was conducted by a person with a visual impairment. Conformability was employed to mitigate the impact of investigator's bias. Therefore, all the findings were treated with high regard, regardless of the researchers' personal experience. It was important that the participants' experiences were captured in a correct manner that did not favor the researcher.

The interviews were recorded while they were being conducted to ensure reliability. The interviews were held in English and translated into IsiZulu when necessary to clarify topics or themes. The fundamental elements of conducting interviews with the participants are gathering data, focusing the analysis, recognizing different experiences, and identifying arrangements and connections within and between categories.

4.8 Summary

The method and methodology have been discussed in this chapter. The chapter emphasizes the significance of a qualitative research approach and how the data was gathered using a desktop research approach and conducting interviews. To better understand students' and the impact of assistive devices at UKZN, this study used qualitative research. The desktop approach was used to analyze and comprehend the various literature about the effect of assistive devices. In this research, the desktop research approach was used to investigate the various sources regarding the impact of assistive devices on people with visual impairments. Furthermore, the online resources that were used for this dissertation were beneficial in developing a broad understanding. In this study, semi-structured interviews are used to gain a better understanding about the different effects of assistive devices. The chapter has also highlighted how data has been collected, the location of the study and the different ways of interviewing and transcribing. Having a proper plan for conducting the interviews and transcribing the data was important towards the final results in this study.

Chapter five

Research Findings

5.1 Introduction

The study results show that assistive devices play an essential role in the life of students with visual impairment in the University of KwaZulu-Natal Pietermaritzburg campus. Although significant ethical implications and challenges exist, assistive devices create a promising society for all. UKZN PMB campus students with special visual needs face some of the following challenges: a lack of access to assistive devices, high prices of the different assistive tools, and lack of proper training, which create more issues for them. This chapter discusses and summarizes the crucial results of the experiences of students who have special visual needs who are based in the UKZN PMB campus. The experiences of twenty participants in this research were divided into different themes and discussed in this chapter.

5.2 School Background and Experiences

The experiences of students who have special visual needs who study at the UKZN PMB campus with the use of assistive devices began in primary and high school for some of the students. It is important to note that the experiences and challenges between mainstream and special needs school students differ. Students who attended mainstream school experienced more challenges that disadvantaged them compared to students who attended special needs school. This is because students who attended special needs schools received more support, ensuring they gave their full potential or capacity. The curriculum and ways of teaching were designed to be suitable for students with special visual needs, such as extra hours during tests and exams and providing different assistive tools that would meet the students' needs.

According to Mthethwa (2017), one of the services provided at special needs schools for visually impaired students is orientation and mobility (O&M). O&M training is provided to visually impaired individuals to assist them in orientation and navigating their spaces. Notably, when students with special visual needs enroll at a university, they face several barriers to navigating their environment due to being in a different environment. However, many students who are totally blind at UKZN PMB find their smart canes very useful when moving around campus, although it is sometimes difficult. It is also important to note that UKZN also provides the support necessary to ensure that students easily navigate their spaces.

Bishop and Rhind (2011:10) suggested that "barriers or challenges against students with special visual needs may be encapsulated by four broad categories: attitudinal, institutional, environmental, and physical." Attitudinal challenges are those that affect the experiences of people with special visual needs. Attitudinal challenges include the discrimination, stigma and stereotype individuals with special visual needs face when trying to be part of their societies. It is important to be able to deal with the different social challenges in order to mitigate some of the marginalization (Jones 2000). Institutional challenges are when students are not properly accommodated, they face challenges that keep them from reaching their full potential.

Institutional challenges include physical access issues, proper accommodation in different spaces especially lecture halls. "Institutional barriers relate to the provisions made for students with special visual needs, such as specialist departments, which are now increasingly common in the 21st century" (Bishop and Rhind 2011:42). When students are not provided with accessible notes or the necessary assistive devices, they feel marginalized (Harris & Oppenheim 2003). Environmental barriers include not having access to certain infrastructure and not being able to locate lecture venues like other students, which limits the student with a special visual need. Physical barriers are some of the physical consequences that students face after using assistive devices.

These consequences can include headaches or tiredness. Physical challenges limit students with special visual needs because they are demotivated and discouraged from using their assistive devices (Vancil 1997). According to Mthethwa (2017) when students find it challenging to cope with the demands of tertiary life, academic staff may view this as a sign of failure. This, in turn, may have historically engendered a view in which students with special visual needs are seen as requiring special treatment rather than possessing a right to an education. Nonetheless, specific challenges have been identified concerning the resources provided for visually impaired students. For example, students must be given printed information in a format that is accessible.

5.2.1 School-related experiences and assistive devices

Environmental barriers affect access to buildings, classrooms, and lodging. It can be difficult to locate buildings, navigate a university campus and access lecture halls (Bishop and Rhind 2011). "Some of the barriers, however, can be overcome by using lifts, automatic doors, appropriate signage, and other assistive technology" (Bishop and Rhind 2011:31). In addition, Bishop and

Rhind (2011) claim that physical barriers, such as headaches or tiredness after extended periods of reading, are more difficult to overcome through social adjustment. It is essential to note that an environment without challenges is a myth that cannot be sustained.

When learners enter higher education institutions, they face a challenge because adapting to the curriculum used in higher learning institutions is difficult. Mthethwa (2017) investigate the learning barriers that students with special visual needs go through in UKZN. Mthethwa (2017:87) also states that students who attended segregated schools faced significant difficulties adjusting to the curriculum, study materials, and infrastructure and socializing with non-special needs students in higher education. The infrastructure of the special school is disabled-friendly, and the study materials are provided in a way that accommodates their special needs. Various teaching and learning methods adequately accommodate the special school's students.

One advantage of special schools is that students are easily accommodated (Mthethwa 2017). As a result, they have higher self-concept and self-esteem because they see themselves as equal. As a result, students with special visual needs have shared similar stories about their experiences at segregated schools. This study's findings show that students who went to mainstream school had different challenges than students who attended special needs schools, this allowed the students that attended special needs school to adapt more smoothly to university life. Below are the different themes that were important in the study and answers to the different questions of the interview schedule and questionnaire:

5.2.2 Theme 1: Outcomes of assistive devices towards the participants and in special needs education

There is a wide range of assistive devices used in special needs education. The participants in the study have identified several devices that they use daily. These devices not only help them with their social lives but also help them with their academics. This study has included both blind and partially sighted students and they have different experiences. The following are the answers to questions 1, 2 and 3 of the interview schedules:

Female participant 1: My device is a laptop with Jaws software. This is the primary tool I use, particularly for academic purposes. I also used a money stick to indicate money and a liquid indicator, both of which are extremely helpful. With my mobility, I use a cane to help me navigate my surroundings, particularly around campus. I also use (Talk Back), a screen reader program on my phone. The screen reader has been installed and can be found under settings.

Male participant 1: I have started using a white cane for mobility, and it has made my life a lot easier. For my academics, I started with large print in primary school and progressed to Perkins Braille until I finished high school. In sixth grade, I began using braille. I had to make a transition and adapt to using a laptop with JAWS software in tertiary school.

Female participant 2: I use a smart cane, which helps me navigate; a laptop with JAWS; a money stick, which helps me identify money; and finally, I use Talk Back on my phone.

Female participant 5: The first device I would like to mention is a cane, which I use as a blind person to navigate or find my way around. Second, I have a laptop with JAWS software, which is helpful for my academics.

Female participant 10: I read and write notes with a Magnify Explore 5, and I also use an app called Talk Back on my phone.

Male participant 8: I use braille, a smart cane, and a laptop with JAWS software.

The findings of this study have noted that the majority of students' experiences with assistive devices are similar and limited. This is concerning because numerous assistive products are available, but students have access to only a few. The following students had this to say:

Male participant 5: As a person who became blind later in life, it has been extremely difficult for me, but assistive devices have played a significant role. I have used a voice recorder, a smartphone with accessibility features called Talk Back, and a laptop with JAWS software.

Male participant 2: I record everything. This device is essential for recording meetings or classes. I also have a laptop with a specialized program like JAWS or NVDA (Nonvisual Desktop Access). The programs are screen reader applications. I have to include my cellphone because I use it with a screen reader, which is extremely useful.

Female participant 8: I have been using a laptop with JAWS and a recorder since I started university, and it has been beneficial.

Female participant 12: I use a laptop with jaws, a voice recorder, and a white cane.

Female participant 7: I use jaws and talk back on my phone, which is very useful. I also use a magnifier, especially when reading, but when my eyes are tired, I use Talkback.

To deal with their various challenges, both male participant 4 and female participant 4 wear glasses. The participants made the following comments:

Female participant 4: I use glasses and a telescope, both of which play an important role. Apart from Zoom text, I do not use any software.

Male participant 4: I only wear my glasses.

5.2.3 Theme 2: outcome of assistive devices and their impact on education

According to Vaidya (2016) students with visual impairments can collaborate with other students in lecture halls, computer labs and actively participate in all other academic activities. Through accessible telecommunications and office equipment, students with special visual needs can also participate in communication and educational administrative tasks. The following students have similar experiences to question 4 of the interview schedules:

Male participant 1: Assistive technology has contributed positively towards improving my life. These devices have improved my academic performance. I can do everything that is required of me as a student at UKZN by using my laptop. I also use a voice recorder, and this is extremely helpful in recording my lectures.

Male participant 5: My assistive devices connect me to the world and allow me to participate in society. These devices enable me to stay informed about what is going on in my community and institution. Because I am also a social media user, I am always up to date.

Female participant 12: I mostly use a cane to get around and participate in my institution. I also find the "talk back" app on my phone, which is a screen reader, very useful, especially when interacting with other students and lecturers. This is significant in my academic career because I am also expected to perform to the best of my ability.

Male participant 2 and female participant 8 discuss the significance of Talk Back, JAWS, and the recorder in their studies:

Male participant 2: I consider my devices to be extremely important in my life. Starting with my cellphone, I can use it with a screen reader called Talkback. This application allows me to freely communicate with others while also keeping me up to date. Second, my laptop with JAWS is extremely useful to me. I can use my laptop today because of the available assistive device's applications and programs. I also value my recorder because it allows me to record my lectures and meetings. This allows me to listen to the recordings and take proper notes.

Female participant 8: My assistive devices are extremely beneficial for my academic performance. When reading my notes and using Google, the JAWS and Talk Back applications have both been useful. However, I find my recorder to be extremely useful because I get to record during classes.

5.2.4 Theme 3: analysing assistive devices at school and beyond

When students enter the UKZN PMB campus and start their annual public-school years, assistive technology is part of their inclusion process. For students that qualified to be in university, assistive technology is given to student in order to better accommodate and support placement in unfriendly environments and make sure students excel in their academics.

Assistive devices must be considered as an important tool for every Individualized Education Program. The use of assistive devices does not only play a role in the education program but even beyond, especially in the workplace. It is, therefore, essential that not only are assistive devices provided in schools, but assistive devices should be provided in all government departments at all levels. Assistive devices are necessary, especially when their presence enables the student to make reasonable improvements toward the goals identified in the education program. Questions 7 and 11 were aimed at exploring the experiences of using assistive devices before completing high school and beyond, in the communities and institution. The following are the responses to questions 7 and 11 of the interview schedule:

Male participant 2: Unfortunately, I only started to properly use most of the assistive devices I am using in the tertiary level of education. In primary and high school, I used braille to read and write, which I did not use when I came to UKZN. However, using a cell phone during my primary and high school was difficult as they did not have applications to accommodate visually impaired people. At UKZN, I was exposed to different devices, which play a vital role in my academic journey. However, it was not easy to adapt to using these devices as I thought it would be challenging. After some time, it was easy to use devices such as a laptop and a smartphone on my own for my daily tasks.

Female participant 2: I was aware of some of the assistive devices in high school. A company by the name of Sensory Solutions visited our school to show us the different devices they have. However, these devices were heavily priced, which prevented me from getting them.

Female participant 12: I only started to use braille when I was in high school and about to complete it. The other devices I found here in the tertiary institution.

Male participant 8: Fortunately, I attended a special needs school. In this school, I started to use my devices at an early stage from primary school. In tertiary, I was exposed to using a laptop with JAWS for my academics.

Female participant 7: In high school, I used a braille Perkins. That is how a blind learner went through the academic journey in our school. The Perkins was used in both my primary and secondary school.

Female participant 4: I have been using glasses since grade one and high school. I used to attend a special needs school, which made it easy for me because the school supported me. In tertiary, I did not get the disability NSFAS funding, meaning I had to buy my glasses through my mum's medical aid.

Students who use assistive devices at a young age have different experiences than those who become blind in their twenties. Responses to questions 4 and 6 on the questionnaire:

Female participant 1: I lost my sight as an adult, so I went through high school as a regular student. However, braille was first introduced to me. I was not very good at this, so I did not put much effort into it.

Female participant 5: I began using assistive devices in tertiary school. This is because I went blind after finishing high school.

Female participant 8: I only started using my assistive technology when I started university. I went blind in my early twenties while attending university. This forced me to adapt and learn new things.

Male participant 1 and Female participant 7 shared their high school experiences with assistive devices:

Male participant 1: I began using assistive devices in primary school and continued to use them throughout my academic career.

Female participant 7: In school, I used braille, which was very useful.

Students with special visual needs who went to mainstream school also reflected on the difficulties they faced and how they had to adapt to the learning environment. This was due to their needs or requirements not being met because they were treated as non-special needs learners who were accustomed to the mainstream learning environment. As a result, the learners were excluded from some educational activities, such as attending some subjects held in locations that were not accessible to learners with special visual needs or participating in sport activities. Mainstream schools are designed to accommodate non-special needs students and do not provide support for students with special visual needs.

Participants have therefore shared the challenges they faced at mainstream school:

Male participant 3: I could not see the notes or the projector in any of the classes I attended, making

it difficult to concentrate. I was always behind because all I could do was listen to the teachers. It was not easy in high school because I could not see the chalkboard.

Male participant 4: I began wearing glasses in first grade and continued to do so throughout my academic career. However, I attended a public school, which presented some difficulties.

Female participant 5: I would say I went to a mainstream school, and I faced many challenges. The glasses that I required were to be bought by my mother. Hence, it was hard to afford a pair of spectacles throughout my primary and high school. As a result, I only started to use spectacles in UKZN.

Male participant 3 also believes that there were more challenges in high school:

Male participant 3: I believe it was worse in high school, and I think that if I had the appropriate devices, I would have performed better with the assistance of assistive devices. I also believe it is better here at university because I can use my lecture notes if I obtain them from other students. Teachers in high school were impatient with me because I could not see the chalkboard. A teacher would write on this side of the board and then erase it before I finish writing my notes. I was sometimes discouraged from attending classes because I was confused or felt left out

5.3 Experiences of using assistive devices in school

The participants have discussed their academic journey experiences, highlighting both their high school and university challenges. The findings indicate that much work is required to adequately accommodate learners with special visual needs.

5.3.1 Theme 4: Outcomes of challenges faced before receiving assistive devices

The following are answers to question 9 of the interview schedule. Male participant 3 described his experience without an assistive device. For some students, it is due to a lack of information about the assistive devices they require or a lack of funds to purchase them. The participant stated the following:

Male participant 3: As a student with a visual impairment, it has been difficult to cope without any device or glasses because I am always behind because I lack the necessary devices. First and foremost, I am unable to take notes in class. This impacts on me negatively because I cannot participate in class or progress in my studies.

Some students face additional difficulties after breaking their assistive devices. Male participant 4

and female participant 4 describe some problems they encountered after breaking their glasses.

Male participant: First and foremost, I struggled immensely in class because I could not actively participate. I once broke my glasses and had to buy new ones. It was not easy during that time because I could not do some things independently.

Female participant 4: I have broken my glasses several times and have faced some difficulties, particularly in my education. This is because some students did not recognize the significance of my glasses. My challenge was when I did not have a designated seat in lecture halls, and it was not easy to see without glasses. I could not see because the first row would be full.

The following students have discussed some of their difficulties in obtaining assistive devices on time and receiving effective training on software such as JAWS. This situation presented several academic challenges to the participants. The following responses were based on question 12 of the interview schedule which seeks to identify the different implications of accessing or affording assistive devices:

Female participant 5: When I first arrived at UKZN, I struggled with academics because I lacked the necessary devices to help me. I could not complete my schoolwork like other students and had to borrow some of the assistive devices. With the help of NSFAS, I could purchase the devices that made my life so much easier.

Female participant 12: In school, the most challenging problem is having to go around asking people to lend you their devices, which is difficult because I would need a computer with a specialized program. For example, as a master's student, using other software on my computer will be difficult because I cannot read my supervisor's comments. However, it is more difficult in my community if I do not have the devices. I would have to rely on others to guide me. It is sometimes even possible for someone to steal from us.

The following students believe that assistive devices are expensive and difficult to obtain:

Male participant 5: My only issue is that assistive devices are costly. This has prevented me from purchasing some critical devices.

Male participant 2: Some difficulties stemmed from the fact that assistive devices are expensive, and I was uninterested in obtaining them. As previously stated, I used braille as my writing device in high school, and there was a school period dedicated to teaching braille and computers; however, those periods were not particularly useful or well-taught. So, I struggled in university because I was not good at using a computer, and it took time for me to adapt because I did not have the

necessary software or assistive devices. So, even if I had tried to obtain a laptop, obtaining the JAWS software would have been difficult. I was also unaware of the various types of assistive devices, which limited me in multiple ways. Also, coming from a society with a small number of people with special needs altered my perspective as a person with a special need.

A lack of proper training in assistive tools causes some difficulties. This causes additional issues for students with special visual needs. Students also believe that the university does not do enough to help students with training. Students also believe that devices are poorly designed, resulting in a short battery life. The following students have contributed:

Male participant 7: I can say that not having the proper devices has caused me several challenges. For example, I come from a background where I was not computer literate and did not receive laptop training. So, when I first arrived at this institution, I was required to be familiar with these computers or laptops. If one enrolls in UKZN, one should be computer literate. There was a time when we had to do an assignment and bring our contributions; it was difficult for me to participate as a student with a special visual need because I did not have any device. I did not have a proper laptop to type my part.

Female participant 2: One of my difficulties is not using my laptop effectively. This is because the JAWS software on my laptop would occasionally stop working, preventing me from doing my schoolwork. This presents many difficulties because I cannot read or write academic work from the class.

Female participant 10: My main issue is that the magnifier has a short battery life. This challenges me because I sometimes use it during exams, and the battery would just quickly be empty, which disadvantages me. I also encountered difficulties because I lacked proper JAWS training, limiting my laptop use. This has forced me to find alternative methods of reading and writing, such as using my phone.

Male participant 1 explains that being able to use assistive devices from an early age has helped him deal with challenges more smoothly:

Male participant 1: I would not say I have faced many difficulties. I began using assistive devices early during primary school, which helped limit the challenges. The only significant problem is getting around without my white cane.

5.3.2 Theme 5: analysis of coping methods

The following responses are based on question 6, 7 and 16 on the interview schedule. For this

study, it was important to identify the different coping strategies that students use in order to survive university life. This also included how students with special visual needs adapt to the different challenges they face more especially when it comes to performing in their academics. For some students, it is crucial to work together with other students in order to cope with the academic work load. Borrowing or sharing assistive devices is one of the coping strategies for many students. Participants share some of their important coping strategies used when they do not have their own devices. The following are answers to questions 6, 7 and 15 of the interview schedules:

Female participant 8: Firstly, I received my devices late in the year, so I was always behind and could not keep up with the workload. This affected me to get study materials from the learn online page. To cope or adapt, I had to rely primarily on other students.

Female participant 1: I am fortunate that those around me understand, and if I require any devices, they will try to lend me. I have adapted because I try to communicate with those who know more, which is a foundation. Even if I am confident, there are some things I am unaware of, and I try to ask people who have the information.

Female participant 5: Borrowing from other students was one of the plans or solutions. This was sometimes difficult because they did not have the necessary software. I also went to the disability unit, where I received assistance.

To some students, the DSU is one of their most helpful departments where they receive the most support. The DSU plays a role in supporting students by providing them with the necessary assistive tools. This is one of the strategies to create an accessible university for all. The participants have highlighted the following:

Female participant 2: I relied heavily on the LAN and the Disability Support Unit, particularly the reformatting staff.

Male participant 5: One of my solutions is selling items to raise funds to purchase the various devices. I have also participated in multiple internship opportunities, which have aided me. I have also made use of the disability unit's devices.

Male participant 7 finds the friends he has met instrumental in dealing with the many challenges. It is essential for some students to integrate with other students. This makes their life easy as they can quickly get help if they need it.

Male participant 7: Having friends is one of my many solutions to many problems. As students, we face similar challenges, so it is sometimes necessary to share assistive devices if one does not

have one. I have also shared my challenges and experiences with other students so they know I need or want their assistance.

For some students, it is not easy. To deal with their difficulties, students employ a variety of coping strategies. Female participant 7 have different coping strategies:

Female participant 7: I try, I use my phone, and use braille for tests and exams.

Female participant 12 believes there can be a promising solution for making assistive devices more accessible and helpful in dealing with various challenges.

Female participant 12: The best solution would be for people with special visual needs to buy their devices in any store, just like other technological equipment. When attempting to deal with social challenges, affordability and access to various assistive tools also cause several issues. Many people with special needs do not work, and increasing the prices of these devices makes them more challenging to obtain.

5.3.3 Theme 6: outcomes of inclusive environment and using assistive devices

Students believe assistive devices are playing an essential role in their school and creating an inclusive environment which is encouraging. Some of the participants believe assistive devices have facilitated their inclusion in educational programs. The following answers were based on question 5 of the interview schedule.

Female participant 1: Assistive devices have created an inclusive learning environment. As a student, mainly as a blind student, one competes with other students. As a result, it is easy to perform academically and not feel left out which makes me feel included. Thus, technological advancements have allowed an inclusive education which is significant towards students with special visual needs. Whether it is academics or sports, there is enough room for everyone.

Male participant 1: Assistive technology is significant in my studies. They are fostering an inclusive learning environment because I do not feel excluded. I am capable of completing any task that is assigned to me.

Male participant 4: I have been able to see even if people are far away and be able to compete with other students. My glasses were handy at school because I could not read or write without them. I doubt I would have received my grade 12 without my glasses because I cannot function without them.

Female participant 7: Although assistive technology may be promoting inclusive education, I believe that for it to be effective, people must be educated to understand people with special visual

needs better and better accommodate them.

Students also believe that assistive devices have enabled them to gain access to online platforms that are important to them. Using platforms such as Zoom and Microsoft Teams has altered how people learn, particularly since the spread of the Coronavirus. Many classes and meetings have shifted to online platforms for many students, particularly those in the College of Humanities. Participants shared the following experiences:

Male participant 8: I can now fully participate in my studies thanks to the use of assistive devices. I can now communicate with lecturers and attend online classes, which I previously thought would be difficult. Communication between my lecturers and myself is mainly done via email, which is not difficult. I believe this has created an inclusive environment for me and other students with special visual needs.

Female participant 12: I believe technology has played a significant role. Modern technology or learning methods may be complex, but I can deal with various issues with the use of assistive devices. Accessing multiple online platforms can sometimes be difficult, especially for visually impaired people.

Female participant 5: Assistive devices, in my opinion, have played a critical role. When I first arrived at UKZN, I had no idea how to use a laptop and had received no training. However, JAWS software advancements have been useful, I can now study properly and use my laptop effectively. Also, through the development of the screen reader application (Talk Back), I can now use a smartphone and participate in online classes.

Although there is great hope for an inclusive learning space that can accommodate students with special needs, some students believe it is still difficult since some community members do not understand them. This also include how these community members show care to students with special visual needs. These actions often lead to a sense of unwanted or not being tolerated by other community members towards students with special visual needs.

Female participant 2: Technology has aided my transition to university and my ability to compete with other students. In terms of an inclusive learning environment, I believe it has been challenging because some people are unaware that students with special visual needs use assistive devices. This makes me have to explain myself every time.

Male participant 8: To be honest, assistive technology has not resulted in a completely inclusive

learning environment. Still, I think communication between myself and my lecturers is hampered, causing them to misunderstand me.

5.3.4 Theme 7: Support channels in and out of UKZN

According to Mthethwa (2017) the bursary that students with disabilities receive covers various expenses, including academic registration and tuition, which are paid directly to the institution. The student is also compensated for study materials and lodging. Meals, assistive devices, books and human support are all paid directly to the student's bank account (Mthethwa 2017).

The Department of Education provides bursaries to students with special needs (NSFAS Disability bursary), 18 of the participants have received this kind of funding support. The bursary is suitable to accommodate all of the requirements of students who have special visual needs. According to Mthethwa (2017:69) the requirements include "tuition, resident fees, meal allowance, book allowance, and assistive devices allowance."

The following are responses to question 7 on the interview schedule. These responses highlight the effectiveness of the NSFAS disability bursary:

Male participant 1: I have only received assistance from the NSFAS disability bursary and the UKZN PMB disability unit. I purchased several assistive devices through the disability bursary. These devices have allowed me to have a more enjoyable learning experience. The bursary also provided me with funding, which was critical in paying for the assistance, which I required. Being a student with a special visual need at university can be difficult. However, receiving personal assistance ensured that I dealt with the various barriers and quickly adapted to the environment.

Male participant 2: When I first came to UKZN, the National Student Financial Aid Scheme helped me purchase assistive devices.

Some students stated that they received assistive devices from institutions other than UKZN. This demonstrates that it is exciting that other sectors also play an important role in assisting students with special visual needs with their assistive devices.

Female participant 1: I went to a research center before coming to UKZN. The research center was crucial in providing advice and knowledge about assistive devices. The DSU was also involved in assisting me to obtain NSFAS allowances, and I could purchase useful assistive devices.

Female participant 2: I received assistance from an off-campus college. This is Pretoria's Optima College. This college has also provided training, allowing me to use my devices properly and

achieve greater results.

Male participant 5: I received most of my assistance from the Optima College resource center.

Some students find the assistance provided by the Disability Support Unit (DSU) to be highly beneficial. The DSU performs the following functions for the following participants:

Female participant 5: The DSU at the UKZN PMB campus is the only Department that has helped me. Even if I needed to repair my devices, such as my cane, I went to the DSU for assistance.

Female participant 7: The DSU at the UKZN PMB Campus assisted with most of my devices. The DSU has ensured that I receive all the assistance I require. However, no departments outside of campus have assisted me in obtaining any device.

Female participant 12: There are currently no departments that have assisted me. The DSU at the UKZN PMB campus has been the only Department that has been helpful.

However, it is troubling that some students have not received assistance from any department in obtaining their assistive devices. Male participants 3 and 4 are unaware of any department or sector that could have assisted them in obtaining the necessary devices. The students were not fully aware of the support provided by the DSU.

5.4 Theme 8: outcomes of artificial intelligence and specialised software

The below responses are based on question 8 on the interview schedule. Fourteen of the participants in this study are unaware of the various forms of artificial intelligence that could play a role in their lives. This is because some students come from rural areas where resources and technology to help individuals with special needs are not prioritized. Some participants became blind in their twenties, limiting their knowledge of specialized software or artificial intelligence to assist individuals with special visual needs. The following participants, however, have shared exciting experiences:

Female participant 1: when I was still at Optima College, a group from France visited and they demonstrated Artificial intelligence. One of the assistive devices I was interested in was artificial intelligence Smart glasses. Individuals with special visual needs use these glasses to know what is before them. The glasses also play a role in providing directions to the person with a special visual need.

Female participant 2: I have used internet platforms such as artificial intelligence robots. As a visually impaired person, this type of AI guides me. I have also encountered elevators with specialised speech. This has given me the ability to be self-sufficient. I have also used a road robot

with a specialized sound to help blind people.

Male participant 5: I have come across road robots with specialized software. Although they are only available in major cities, they have been significant game changers. I have also used a smart television in conjunction with a screen reader. This has enabled me to be self-sufficient and live my life. I have also used an elevator with a unique voice. This equipment has helped me to be self-sufficient and even travel to hotels or be fully immersed in various environments.

Female participant 8: I have used an elevator with a specialized voice program. This has given me independence because I can now navigate independently.

Students with special visual needs believe that numerous artificial intelligence products are available but not easily accessible. In most cases, these AI products are only available in urban areas, but not available to individual with special visual needs in rural areas.

Male participant 7: One example of artificial intelligence I have used is an elevator with a speech program. Another thing is that I am aware that some ATMs have a speech program, but I have never used one.

Female participant 12: Although I have heard about road robots with a sound that assists individuals with visual impairment, I have not encountered one. I know that they are primarily concentrated in Durban or urban areas, making it difficult for me to be mindful of them as a person from a rural area. When crossing the street, I rely on my hearing senses or the guidance of others. What is more exciting is that the lifts are mainly accessible to visually impaired people because they have braille and a speech program.

Male participant 4: I have not encountered such devices or artificial intelligence in my community. Because I am from a rural area, it is difficult for me to find such assistive tools.

Male participant 8: I have found assistive road robotics highly beneficial. Although where I come from, such progress is still lacking in rural areas. They have given me the freedom to be independent while keeping me safe.

5.5 Experiences of using assistive devices

UKZN have invested in developing comprehensive technology-related assistance programs that have proven effective in assisting individuals with special needs to gain access to an equal learning experience. UKZN provides an important support to students with special needs through ensuring that all students have the necessary devices. These devices offer students a unique experience that makes them feel included. Although there are still some challenges with adapting to the different

assistive devices, participants feel like they can now interact with others and feel accepted.

5.5.1 Theme 9: Adapting to using assistive devices

Significant development has been ensured towards improving assistive devices, this includes making significant improvements on already available devices that impact daily activities that are important to people with special needs of all ages. Access to assistive devices can also support and reduce spending on early childhood intervention, education, rehabilitation and training.

The use of assistive devices has enabled students with special visual needs to be independent because they find some of them easy to use. The following participants have shared their experiences based on question 10 of the interview schedule:

Female participant 1: I believe assistive devices are essential to people with special visual needs because they allow us to deal with different challenges. If I only talk about ATMs, having specialized ATMs is essential for individuals with special needs because it allows us to be independent. As we all know, some people may want to take advantage of the money of a person with a special need. Many problems could be avoided if we could all use ATMs independently.

Male participant 1: I would say that assistive devices have enabled me to deal with my daily independence.

Female participant 2 believes that the invention of assistive devices has improved her life and that she can now compete with other students on a level playing field.

Female participant 2: My assistive devices allow me to compete on the same level as other students. This boosts my confidence because I can now participate equally.

Male participant 2 believes that fear prevents many students from quickly adapting to and using the various tools. Although there are not many obstacles, the main one is the fear of change. Things like the bank application, which many of us are afraid to use, remain challenging because we are afraid to use them independently. Sometimes, the applications we use on our phones, such as Talkback, make other things accessible.

Male participant 5 and female participant 8 believe that one of the most difficult challenges is

keeping up with changes in modern technology. Throughout the world, technology and software are regularly updated. This presents difficulties for students with special visual needs because no one trains them on the changes. Fortunately, students end up searching for information on online platforms.

Male participant 5: One of the most difficult challenges is that devices are frequently modified or updated, making it difficult to keep up. For example, I used to use JAWS, but now I am forced to use NVDA. Although it is still difficult, we can still find information on how to use those devices on the internet or YouTube.

Female participant 8: Using the JAWS software at first was difficult because I had to balance schoolwork and learning. It was difficult because I had no training. It is also challenging to keep up with the changes in Windows and the various ways to use JAWS.

The most difficult challenge for female participant 5 is obtaining university training. The findings indicate that a well-functioning program to assist students who are not computer literate is desperately needed.

Female participant 5: Because I only began using the devices when I arrived at UKZN, I found it difficult to use some of them because I was unfamiliar with them. For example, it was difficult for me to adjust to using a smart cane. As a result, I unfortunately broke it. It has been difficult even with the use of a laptop. I arrived in 2019 and am still struggling because I never received training.

Female participant 1, on the other hand, believes that she has been encouraged to teach herself how to use the various devices because she has not received any training.

Female participant 1: It has been critical for me to train myself to adapt to assistive devices. I believe it has been a work in progress through the use of assistive devices.

5.5.2 Theme 10: Implications for using assistive devices

After using the assistive tools, some students still believe there are some consequences. Some students reported having issues after using the devices or software. The following students have shared their responses to question 12 of the interview schedule:
Female participant 2: I rely heavily on JAWS, and as a result, I occasionally get headaches.

Male participant 4: When I study for a long time, I get a headache, and my eyes get tired.
Female participant 8: Listening to or studying with JAWS is exhausting. Most of the time, I'm just tired and may even fall asleep. I get headaches when I listen to JAWS for an extended period.

For some students, JAWS is not the only assistive tool that creates issues for them. Female participant 10 and male participant 8 share the following experiences:
Female participant 10: My eyes are sometimes affected by the lights on my magnifier. From time to time, I experience some pain in my eyes. I also rely on my phone, which strains my vision.
Male participant 8: The first issue I continue to face is that assistive devices are prohibitively expensive. Another problem was that I lacked proper information about where to buy high-quality devices, so I purchased low-cost devices that quickly broke. Another issue with using JAWS and Talkback for an extended period is that these screen reader programs frequently cause headaches.

Some students believe that using the devices has no consequences. The following participants have shared their experiences:
Male participant 2: I have never had any consequences for using assistive devices. There are no consequences, even if you use JAWS.
Female participant 12: I would say there are no implications for now.

5.5.3 Theme 11: Interaction with other community members and students

The following responses of participants were based on question 14 of the interview schedule. Question 14 aimed at clearly identifying the different challenges with interacting with other community members and students. Some students spoke about positive experiences they have had in their communities. Although some community members are familiar with some assistive devices, there is still a need for a disability awareness campaign. Some of the following students have highlighted some of their experiences:
Male participant 1: My interaction has been positive. They appear to understand me and my devices. Although our mobility may not be the same, they know and ensure no impediments in my path.
Female participant 4: Yes, I believe that most of my community members are aware of the assistive devices I use and that I am partially sighted. Some people are unsure whether my glasses are for

my eye problem or fashion. My mother once said, "Zaze zamufanela izibuko" (she looks nice with the glasses), which made me happy. It is sometimes difficult because I cannot see something, and some people are surprised because I will be wearing glasses, which is a concern.

Female participant 5: I have had a great time interacting with other community members. I also believe that, while some may understand the assistive devices I use, there is a need for a disability awareness campaign. Sometimes, I get a lot of questions, and I have to explain to those people about the various assistive devices I use.

Some students still find it challenging to interact with other community members. Despite the fact that some students prefer university, where some students understand them. The participants share the following experiences:

Female participant 1: I believe visible assistive devices like a cane are easily understood at university. On the other hand, people in my community are unaware of assistive devices. It is also concerning that some members of my community are surprised if someone with a special visual need attends university. It is extremely difficult to communicate or interact with these people.

Female participant 2: the interaction is complicated, and I must explain myself each time. When I mentioned my white cane, people approached me and asked, "What is this stick you are using?" As a result, I must explain how this white cane helps me navigate. Some students have never seen some of our assistive tools, making comprehension difficult. People will not understand unless we create awareness. Some students are even surprised if I participate in class and explain how to use my devices to them.

Male participant 3: It is sometimes difficult for people to understand me so that I can interact with them. If I do not see a person, they may become offended. Lecturers also believe I don't particularly appreciate participating or taking notes in class, although I am having difficulty seeing.

Some students still find interacting with other community members and students challenging. This is because some people do not understand, and do not even attempt to understand, the types of assistive devices used by people with special needs. The following students have shared the following.

Male participant 5: People who are easy to interact with or understand are likely to be close to me. Interaction is sometimes difficult because some do not understand and value us, and those discriminate against people with special visual needs. Some people still believe we are a creature that must be kept indoors. I think that disability awareness campaigns can help to eliminate all

forms of discrimination and help people understand us better.

Male participant 2: Some of my community members, I believe, still do not understand the assistive devices used by people with special visual needs. Some of my neighbors are baffled when they see me doing things on my own. I believe that assistive devices are helping me to become more independent. Using a cane is necessary because it helps me fit in with my community.

Some students believe they have a lot of explaining to do as well. However, explaining the use of assistive devices and how people with special visual needs do things can raise awareness, which is important. The following participants share their experiences:

Female participant 8: I believe that other students or community members are unaware of the assistive technology that we use. Many unanswered questions and assumptions plague students. They have no idea how we study or how we use assistive devices. Some might even say, "I don't think you can study as a blind student; how are you reading your notes?" However, interacting with some students is sometimes easy.

Female participant 10: Most people are unaware of the devices we use. Because of their lack of knowledge, we occasionally face rejection from other students. It is only after I explain myself to them that they understand and do not exclude us. For me, wherever I go, I need someone to assist me, so I always explain this to others.

Male participant 8: Interaction with other community members has been amazing but challenging. Most of the time, children end up breaking or playing with those devices.

Participants identified several challenges as weaknesses to equal opportunities towards their education, with a focus on accessibility. Mthethwa (2017) states that among the many challenges UKZN students with special needs face, access to information and technologies and lack of environmental/physical access were part of the most challenging issues. Some participants identified this as a major challenge or barrier to actively participating and having equal access to facilities as others. Several students who believed that UKZN has not done any justice for them expressed concern about their different challenges.

Male participant 2: Some of the accommodation challenges I have experienced in my job where I was told that I do not have the capacity like other employees because I could not see. In those situations, it is not because I lack the capacity or ability to do what is required but because they lack sufficient knowledge or awareness of how an individual with a visual impairment does things, and thus, we are excluded. Even when we have the necessary devices, we are sometimes excluded.

Female participant 4: To respond to this question. I believe it is critical for me to compare UKZN and Wits University. First, the disability unit at Wits functions similarly to the one at the UKZN PMB campus; as a result, these two departments have been extremely beneficial to me as a student with a special visual need. I believe the disability units on these two campuses are adequate. However, I believe there is a distinction between the interaction of the disability unit and other departments on campus. The other departments in Wits take the disability unit seriously, whereas I have not seen the collaboration between different schools or departments in UKZN PMB.

5.5.4 Theme 12: outline of challenges of accommodation

According to Mthethwa (2017), people are disabled by barriers in their surroundings and the society in which they live. This is because they must conform to unfriendly environmental settings created for non-special needs or 'normal' people. Through this, the role of care ethics becomes more useful. For people to be better accommodated the values of care ethics needs to be relevant. Thus, it is important that the UKZN community remains mindful of the different accommodation needs of individuals with special visual needs. This will play an essential role in creating a more conducive learning environment with more positive experiences. The following responses were based on question 15 of the interview schedule where the participants focused on the different accommodation challenges:

Female participant 8: The lecture halls and the gym are two places on campus where I believe it is challenging to find accommodations. It is not always easy to locate a lecture hall on time, and they are not always accessible, particularly to those with special visual needs.

Students demonstrated an understanding of the significance of attending lectures. However, some of the students have a significant challenge during attending classes or lectures in buildings that are not located on spaces they can easily access. Hence, these students are frequently late for their lectures.

Male participant 5: I believe I am well accommodated at my institution. However, there are still several issues in my neighborhood. The infrastructure is still inaccessible, particularly to people with special visual needs.

Female participant 10: Before coming to UKZN, I was sold a dream in which everything was promised. But when I finally arrived here, I was on my own. Mainly, navigating the institution and accessing the various facilities was extremely difficult. Because I lacked training, I had to rely on friends to help me. It is also difficult because my assistive devices arrived late in the year, after I

had already faced numerous challenges. One of my most difficult challenges was not being trained to use JAWS, which would have been extremely useful in my studies.

Male participant 4 believes he is still experiencing accommodation issues when interacting with other students.

Male participant 4: Sometimes, when I am around people who do not understand me, I feel unaccommodated and marginalized. One of my solutions is to explain my problems to those people, and they sometimes appreciate it. This makes it simple for those people to assist me.

5.6 Theme 13: Accessing study material and the role of the disability unit

According to Mthethwa (2017) students' access to information is one of the most essential aspects of university life. All students must complete their assignments, which necessitates having enough information to do so effectively. However, being able to use platforms such as the library services to collect data is difficult for visually impaired students, particularly those who are entirely blind. This is where the role of the disability support unit becomes more significant in ensuring that the library is accessible to all students.

The following participants share their experiences about accessing study material. These responses were based on question 13 of the interview schedule:

Female participant 1: I use a screen reader to access study notes and university websites. This has been useful even when taking online classes via online platforms.

Female participant 5: The JAWS software has greatly simplified my academic life. I was able to access and effectively use my notes on time.

Female participant 8: My notes or study materials are now available. However, I need to convert them from a PDF to an MS Word document to read or edit them. However, some PDF documents can be read with JAWS simply by knowing the correct keys.

Male participant 5: I can read or access any study material using my JAWS software and Talk Back. This keeps me current and productive in my schoolwork. This software has helped motivate me and make me feel included at university.

Some students believe the DSU plays a role in reformatting their notes into an accessible format. Note reformatting is one of the services offered by the disability unit on all UKZN campuses. Students must send their study material to the DSU Reformatting Officer, who will then distribute them to Reformatting Assistants. This allows students, particularly those who are completely blind, to access and read them easily.

Male participant 2: As I previously stated, I usually study on my laptop. So, we take our notes to the DSU to have them reformatted. The study material is converted into MS Word documents, which allow the JAWS software to read them easily. It is also simple to access the learning site, where we would be fully involved in proper learning and simply being a part of everything.
Male participant 4 and female participant 4 both reported having positive experiences with using their glasses to read their study material.
Male participant 4: With the help of my glasses, I can easily read my notes. Everything becomes clear to me, and I have no problems. I also find it simple to get to lecture halls because the numbers on the doors are easy to read.
Female participant 4: Yes, assistive devices are important in ensuring things are accessible for people with special needs, such as myself. Some diagrams are confusing, and I do not think it would be easy without my glasses.

It is encouraging that most participants are pleased with the assistance they received from the DSU. The unit is critical in providing students with appropriate assistive devices. The DSU also ensures that those needing an eye test are transported to get new glasses or the necessary support. This is significant because some students arrive at university without any assistive devices. Students who register with the DSU will receive the necessary support to meet their special needs.
Students are assisted in purchasing their devices through the NSFAS disability bursary at the DSU. In this case, the DSU coordinator helps students understand the various service providers and assistive devices available. Second, the DSU assists students in borrowing assistive devices if they do not have them. This assistance is provided to all students who have registered with the unit. Finally, three LAN (Local Area Network) spaces within the university are specifically designed to accommodate students with special needs. The LAN spaces are located on the main campus at the DSU offices, the main library (ground floor), and the New Arts Building (NAB). These spaces provide students with appropriate computers and software for academic performance.

5.6.1 Theme 14: outline of opportunities created by the invention of assistive devices

There are numerous opportunities for participants due to the invention of assistive devices. Visually impaired individuals must be able to actively participate in today's modern world and understand how the world is changing. Female participants 12 and 2 believe that doors to learning

and employment are beginning to open. This is a positive sign because they can actively contribute to the economy and create a positive impact in their societies. The following responses are based on question 17 of the interview schedule:

Female participant 12: The invention of assistive devices has increased employment opportunities for people with special needs. I could also study because of the opportunity created by the creation of assistive devices.

Female participant 2: I would say the opportunities to access work and higher education have been created. I am from Gauteng and have traveled to UKZN to study, so using assistive devices has allowed me to travel independently.

Male participant 2 also emphasizes the importance of assistive devices in education and employment:

Male participant 2: Yes, a plethora of new opportunities have arisen. Thanks to technological advances, individuals with special visual needs can now do almost any job they want. According to "White Paper 6 on the Rights of Persons with Disabilities (2015)," every company should have a 7% employment rate for people with special needs. More opportunities are being provided towards students with special visual needs because we can now learn wherever we want.

Female participant 5: Because of assistive devices, I can study, which is very important in my life. As a visually impaired person, I can now function independently.

Female participant 8: The ability to study is my most important opportunity. I could not function without my glasses, and I am unsure what I would have done.

Female participant 10: Assistive technology has enabled me to be self-sufficient and succeed in my studies.

Male participant 8: I believe assistive devices play a vital role in visually impaired people's education.

Female participant 7: One of the most significant opportunities is that people can now be employed in various companies.

Female participant 8: Assistive devices have played an important role in granting independence to those of us with special visual needs. Employment opportunities have also increased as we can be hired more frequently and people are beginning to recognize the potential in individuals with special visual needs. The public restrooms are also easily accessible.

5.7 Theme 15: creating a promising society through using assistive technology for students with special visual needs

The below responses are based on question 18 of the interview schedule. Students interviewed for this study believe that assistive devices foster a more promising society for all. This is a society where everyone can be independent while being accommodated. Many students with special needs have hope due to the various assistive tools that are available. However, some of the ethical implications that need to be dealt with include, firstly, the cost or the affordability of assistive devices. Regardless of the availability of assistive device, they are expensive, which means that individuals with special visual needs cannot or might not afford them. This limits their potentiality and will lead to feather exclusion. Secondly, unavailability of assistive devices in rural areas, especially in primary and high schools. Since education is an important human right, it is important for this human right to be not denied to learners with special visual needs. This might be caused due to the lack of proper devices that could facilitate their educational activities. Another ethical implication is the discrimination of students with visual impairment in the workplace and not offering employment opportunities to them because of their physical conditions and not because of their lack of technical skills or expertise. This is tantamount to treating them as sub-human which is a serious ethical violation of human dignity. It is important that these ethical implications be addressed.

Male participants 1, 5, 7, and 10 are confident that assistive devices create a promising society or environment for individuals with special visual needs.

Female participants 2 and 4, on the other hand, believe that assistive devices are creating a promising society, particularly for individuals with special visual needs. However, there are still barriers that need to be overcome. According to the two participants, these barriers include a lack of information about the various assistive devices, infrastructure, and public services that are not user-friendly for visually impaired people and exorbitant cost of assistive devices. This demonstrates that viable and promising solutions must be implemented to avoid some challenges.

Female participant 2: A promising society that accommodates everyone is possible with the invention of assistive devices. However, there are still some difficulties. Some community infrastructure and public services, for example, are not designed to accommodate a person with a special visual need. Even with our devices, it is still difficult for an individual who is visually impaired to use these facilities. Access to various assistive devices is another challenge we face as

visually impaired people. Companies that sell or provide assistive devices are either far away or difficult to reach. I know that service providers and businesses such as “Edit Microsystems, Sensory Solutions, Blind SA and the South African Council for the Blind (SANCB)” play an important role in providing various assistive tools. Still, I do not know enough about them.

Female participant 4: Yes, I believe assistive devices play an essential role for visually impaired individuals. However, there are still some barriers to overcome. Assistive devices, for example, are costly, making them out of reach for many of us. As a result, we are aware of the various tools that can help us, but we cannot purchase or access them.

Male participant 8 believes that assistive devices play a role in allowing people with special needs to interact and feel like they are a part of society despite being marginalized.

Male participant 8: Yes, I would say. Due to assistive devices, individuals with special visual needs can now interact more effectively with other community members, resulting in a more promising and united society.

Female participant 7 adds that individuals with special visual needs can achieve even greater success by using assistive technology. Students now see a bright future in which they can easily integrate into modern society due to the invention of assistive devices.

Female participant 7: Yes, I believe the development of assistive devices encourages those still studying because they know they will be employed. Companies consider everyone, which serves as motivation for individuals with special visual needs. When people use assistive devices to their advantage, it is much easier for them to seek out better opportunities and live a more independent life.

5.8 Summary

The participants in the study had only special visual needs. Twelve of the twenty participants are entirely blind, while the other eight are partially sighted. Furthermore, it was interesting to hear that the students were eager to interact with different students in any capacity, this included social engagements, academic activities and personal related issues. It could be argued that this is also important in creating and ensuring independence and developing their interpersonal skills. More importantly, despite their special visual needs, the students believed that it was important that they are treated like other students and not excluded at UKZN. However, students also had the opinion that UKZN should provide an equal opportunity, ensuring that their special visual needs are met for them to participate in university activities like all other students entirely.

Chapter Six

Recommendations and conclusion

6.1 Important findings and summary

Individuals with special visual needs rely on assistive devices to ensure a proper learning environment at the UKZN PMB campus. The students not only find their assistive devices useful in their studies but also believe they bring hope for a promising society for all in terms of independence and a society that accommodates everyone. However, there are still significant ethical implications, such as high cost of assistive devices, unfriendly infrastructure that is not user-friendly, society members who devalue and discredit them, and not being able to easily access assistive devices, particularly in schools or rural areas, which leads to further exclusion. According to the findings, some students were fortunate to have used assistive devices throughout their primary and secondary school years. These students' experiences differ from those who were only exposed to assistive devices for the first time at UKZN.

6.1.1 Assistive devices on the education of students with special visual needs

According to the findings of this study, students find their assistive devices useful in their studies. Access to education can be difficult for some students. On the other hand, students who attended special needs schools found the support by their teachers and the use of assistive devices critical in ensuring they received the best education possible. Special needs schools have different provisions than regular schools. Students with special visual needs can effectively collaborate with other students in special needs school using assistive devices. Talk Back, which students use as a phone screen reader, improves communication and access to study materials. Accessing study material was one of the most exciting aspects of using assistive devices and coping in their studies. The findings of this study also show that if proper implementation and training for the use of assistive devices is provided. According to Emerald (2023) “students with special visual needs can easily compete with other students.” The use of assistive devices such as JAWS, spectacles, and voice recorders significantly impacts the education of different students. This is because they can easily access the study materials and track important information.

6.1.2 Positive experiences

Students who participated in the survey expressed that they have positive experiences from their use of assistive devices. The findings show that students with visual needs interact more effectively with other community members. This is because they can now navigate around campus and communities using their assistive devices. This also demonstrates that without barriers in the environment, a person with a special visual need can travel anywhere and do anything.

Assistive devices have created many opportunities for students with special visual needs. Students can now easily access documents in various formats which plays a role in their studies. Totally blind students make use of JAWS, NVDA and Talk Back application to be able to read or access study materials. These applications and software play a role in making documents in various formats accessible to individuals with special needs.

The use of a screen reader allows visually impaired students to access study materials using a computer screen. A screen reader is an essential piece of software for a blind or visually impaired student. According to Mthethwa (2017) a screen reader ensures that individuals with visual needs can easily access whatever is displayed on a computer screen. An important opportunity for individuals with special visual needs is that they are now able to access employment opportunities. The findings of the study show that individuals with special visual needs find their devices useful because they enable them to attain optimal performance level just as other employees. Although it is still difficult to access some employment opportunities, a significant improvement has been achieved.

6.1.3 Negative experiences

The findings indicate that some students face financial constraints when purchasing assistive devices due to the cost of the devices. This makes it difficult for students to replace or afford new devices. This study found that software or applications require regular updates, which increases costs.

Apart from the poor quality of assistive devices, this study discovered that the expensive cost of assistive devices is a serious concern to students with special visual needs. The high cost

of assistive devices has prevented students from obtaining critical devices that they require, which disadvantages them. This forces students to rely heavily on NSFAS to obtain appropriate assistive devices. To deal with the numerous challenges, students always look for possible coping mechanisms. According to the findings, students prefer to use the DSU LAN spaces available on campus. It is worth noting that the DSU has three LAN spaces available to students with special visual needs. These LAN spaces can be found at DSU offices, the main library, and NAB. Secondly, students with special visual needs depend on borrowing assistive devices from other students. The findings show that, while the poor quality of assistive devices remains a concern, they are also expensive.

6.2 Recommendations

This research describes the experiences of students with special visual needs who used assistive devices while studying at the UKZN PMB campus. The majority of the experiences highlight the various assistive devices that are available and used by people with special visual needs. Some of the difficulties discussed are due to a lack of knowledge about the various assistive devices and proper training on how to use the devices. As a result, this study has discussed potential solutions and recommendations for dealing with some of the challenges that students with special visual needs face.

6.2.1 Special needs awareness campaign

During special needs awareness campaigns and seminars, the Differentially Abled Student Association (DASA), a student organization representing students with special needs, must be involved in the planning and implementation. Involving DASA representatives ensures that students with special needs are not left out of such programs and that they have a voice. To properly mobilize all students, it would also be necessary to involve the various clubs and societies that exist at UKZN, PMB campus as well as the Campus Representative Council (CRC).

Hosting educational and informative awareness programs will bring promising strategies to address other student and university staff's lack of understanding about students with special needs. This will be critical in ensuring that students with special needs are appropriately accommodated and accepted in the university community. Implementing the special needs

awareness campaign will also ensure that lecturers better understand students with special needs. Initiating the program will allow the lecturers to take into consideration the various students and various learning needs. Extra hours during tests and exams, a separate room to write tests in, providing accessible lecture venues for everyone, and understanding the use of specialized assistive devices are all examples of learning needs. Meeting these learning needs will allow students to perform on par with students without special needs.

6.2.2 National policies:

Policymakers must have a positive impact in the implementation of national disability policies. It is critical that even people with special needs participate in policy development to ensure that they are included. This will ensure that the university does play a role in providing students with special needs with their requirements. Involving experts with special needs in developing national disability policies would also ensure that national disability policies are improved and implemented as soon as possible.

6.2.3 Providing accessible infrastructure

The university management and other stakeholders must plan and implement ways to ensure a conducive environment mainly for students with different special needs in general and those with special visual needs in particular. A conducive learning environment is important to achieve the principles of full inclusion, equality, and participation within the classroom. For example, a proper environment with suitable infrastructure can benefit individuals with special visual needs. Assistive devices will be more effective with an infrastructure that does not add more challenges. The right to education opportunities becomes meaningless due to poor infrastructures and educational facilities. It is, therefore important for Institutional planning and governance (IPG) to ensure that proper routes and buildings are in place to allow students with visual needs to equally as like other students. Examples of required infrastructures and facilities are retractable ramps, proper pavement and roads, elevators with speech programs, and wide numbers and signs suitable for students with special visual needs.

6.2.4 University policies.

A clear distinction between university staff policy and student policy must be made. This will

clarify who is responsible for the policy's proper implementation and activeness. This procedure should include the DSU and students with special needs to be involved in reviewing and updating the policy. Secondly, a monitoring policy structure must be implemented to ensure that university policies are reviewed so that outdated policies and be updated or changed. To ensure reliability, the monitoring policy structure must be active and ensure that all new changes are properly implemented.

Finally, the DSU and DASA must be included in the policy monitoring structure to ensure that people with special needs are fully represented. The representation will allow changes to be based on facts or reality rather than opinions or assumptions. According to Emerald (2023) “this representation will ensure that students with special needs at the UKZN PMB campus have access to the necessary mechanisms and a positive learning environment.” This will include developing novel approaches to providing students with visual needs and devices required for education.

6.2.5 Inclusive programmes

The university must develop and implement inclusive programs that promote interactions. The university community must collaborate with the DSU and DASA to plan and host events that encourage interactions among students. These programs include sporting and social events to ensure that students are fully included, which will raise awareness about individuals with special needs.

Inclusion in the education sector has a number of advantages, this does not only include the usefulness of inclusive education on students with visual needs but to other students as well. When different students are integrated, it therefore becomes easy for students to understand each other’s differences. Inclusive education also allows students with visual needs to have access to quality education that is affordable and effective. Friendship skills, peer models, problem-solving skills, and respect for others positive self-image can be considered as benefits of inclusion to different student groups.

Collaborative programs are also strategies for integrating all students. This has the potential to benefit all students with special needs. It is important to provide a diverse range of assistive devices and activities that enable various students to collaborate effectively.

One of the UKZN policy pillars is social integration. Achieving full integration within the campuses would allow the students to participate in different programs. Social integration is an important metric for determining the collaboration between different students. For example, building a recreation center that would be accessible for all students within all campuses and ensure that the students can interact with other students. Social integration programs involving students with special needs necessitate an integrated response involving a variety of interconnected role-players.

6.2.6 Collaboration between DSU and external departments

Working with internal and external departments would be necessary to find promising solutions for providing assistive devices to students who are visually impaired. The findings of this research have highlighted how concerning that assistive devices are not easily accessible and affordable. Thus, if the DSU collaborates with other departments to raise funds or donate assistive devices, a difference could be made. Collaboration with South African Mobility for the Blind Trust (SAMBT), Blind SA, Indora SA, Sensory Solution and Natal Society for the Blind would make a difference. Involving different departments and organizations would play a role in getting sponsors.

6.2.7 The practical use of terms and concepts from the theoretical framework

The terms and concepts discussed in the theoretical framework have been important in motivating the recommendations of this study. The critical theory aimed at understanding the different challenges faced by students with special visual needs. Thus, the recommendation of this study seeks to ensure that students with special visual needs receive their necessary assistive devices. Through the ethics of care theory, the study aimed at exploring the care and accommodation means given to individuals with special visual needs. This is morally right since it will provide a better understanding of what needs to change in our societies.

6.3 Study strengths and limitation

The findings of this study are useful in providing detailed information about the experiences of students who are visually impaired at the UKZN PMB campus, as well as raising awareness about the various assistive devices. The provision of profound information will aid in the closure of previously unknown gaps in the university community and society at large. This

will help to better accommodate and create a conducive learning environment for students with special visual needs. Furthermore, UKZN will be more conscious of the environmental challenges, housing requirements and important assistive tools that would be essential in the academic journeys of students.

Two limitations to this study have been identified. Firstly, the study only investigates and narrate the challenge of only students with visual needs. This means that other students' experiences are not taken into account, which is something that should be published. This can be used to better understand how to support and accommodate students with other special needs. It is also critical to note that UKZN does not only accommodate students with special visual needs, but also students with a wide range of special needs.

Secondly, this study focuses on individuals with special visual needs from the UKZN PMB campus. The study's sample size was 20 students with special visual needs, which did not adequately represent students with other special needs. Another ethical implication is the discrimination of persons with special visual needs in the workplace and not offering employment opportunities to them because of their physical conditions and not because of their lack of technical skills or expertise.

6.4 Future research

Although investigating the effectiveness of assistive devices on students with special visual needs is important, it is also important to investigate the experiences of students with other special needs with regard to the impact of assistive devices. This will make non-special needs students more aware of people with various special needs, making it easier for them to interact with and understand them.

Postgraduate students who do not have special needs should also participate in more research on students with special needs because they will provide a more neutral perspective and explore more experiences. Moreover, future research should also focus on the strategies students with special visual needs use to deal with their challenges and how they empower themselves. Investigating whether people with special needs play a role in ensuring that the community can interact with and understand them is also essential.

6.5 Summary of chapters

This dissertation is divided into six chapters. This study's first chapter serves as an introduction to the study which is important in understanding the study and key themes. Chapter one provided the background of the research, objectives and important study questions, all of which are important to the aims of this study. The first chapter also discusses the conceptual and theoretical framework, study methodology, and study outline.

The second chapter focuses on the literature review. The literature covered various topics related to individuals with special visual needs and the assistive devices they use. The literature was based on the global context but primarily based on the South African context, with an emphasis on the period following 1994 and the education sector. The literature also discussed some ethical implications of assistive devices for individuals who are visually impaired. The chapter also explored and discussed the UKZN and national policies. The chapter highlights the UKZN 2004 policy and the Department of Education, White Paper 6, Special Needs Education, 2001.

The third chapter contains a detailed outline of the theoretical framework. Humanitarian ethics, communitarian ethics, critical disability ethics, and care ethics are four key theories that guide the context of this research. The theories discussed play an important role in understanding individuals with special needs.

The fourth chapter discusses the study's method and methodology. The chapter discussed the qualitative and desktop research approaches used to collect data. This chapter also covered the study's location, sampling, sample size, and data collection strategies. Furthermore, the chapter described how interviews were conducted and the various data transcription strategies. The interview strategy and questions were critical in shaping the study's findings. The chapter concludes by discussing the study's validity and reliability.

The fifth chapter provided a detailed analysis of the study's findings. The participants' experiences were detailed, which is important in the study. The findings were divided into significant themes in the chapter.

The sixth chapter provides a conclusion and recommendations. The chapter highlights a summary of the important findings. Positive and negative experiences are provided in the

chapter including the impact of assistive devices. The chapter provides important recommendations that can be useful in dealing with the many challenges affecting individuals with special visual needs and other students with special needs. Chapter six also explored the study strengths, limitations and future research. Finally, the chapter provides a summary of the chapters and concluding statements.

6.6 Conclusion

According to the World Health Organization (WHO), over 253 million people worldwide have special visual needs, with the vast majority having low vision. In the last decade, there has been a tremendous amount of work in developing and improving different assistive devices for comfortable use. Assistive devices are designed to have an impact on individuals with special needs. The purpose of this study was to narrate and investigate students with special visual needs experiences with the use of assistive devices and the impact of assistive devices and ethical implications. This dissertation aims to inform the university and the larger community about the capabilities of existing systems, advancements of assistive devices, and the ethical implications of the devices.

The development of assistive devices has impacted all aspects of people with special visual needs. Students with special visual needs increasingly rely on assistive devices to help them with various visual tasks in everyday life. Students with special visual needs find their devices useful in enabling them to meet their daily independence. While assistive devices have received positive feedback from students with special visual needs, evaluations of the devices' usability were primarily influenced by affordability and user-friendliness, both of which pose challenges to them. However, research on the effects of assistive devices on daily task performance and quality of life is scarce. Furthermore, establishing evaluation criteria is difficult given the diversity of visual tasks and user visual needs.

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Appendix 1

Informed consent form

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL

For research with human participants

INFORMED CONSENT RESOURCE TEMPLATE

Note to researchers: Notwithstanding the need for scientific and legal accuracy, every effort should be made to produce a consent document that is as linguistically clear and simple as possible, without omitting important details as outlined below. Certified translated versions will be required once the original version is approved.

There are specific circumstances where witnessed verbal consent might be acceptable, and circumstances where individual informed consent may be waived by HSSREC.

Information Sheet and Consent to Participate in Research

Date:

Dear students,

My name is Mgcini Sithole. I am a master's student studding at university of Kwazulu-Natal Pietermaritzburg campus under the school of Religion Philosophy and Classics. The topic of my research is "The impact of Assistive Devices on individuals with special visual needs and its ethical implications: exploring the experiences of students with special visual needs in University of KwaZulu-Natal, Pietermaritzburg campus". The aim of this research is to evaluate the ethical implications of assistive devices and explore the experiences of students with special visual needs. I would like you to be part of this research as I would like you to share your experiences and observations on the subject matter.

Please note:

- **The autonomy of participants will be protected through the use of an informed consent form, which specifies (in language that respondents will understand),**
- The nature and purpose of the research will be clearly outlined,
- The identity and institutional association of myself and supervisor/project leader and their contact details will be provided,
- Participation is voluntary and Participants are free to withdraw from the research at any time without any negative or undesirable consequences to themselves,
- The study will go through formal procedures to obtain ethical approval from the University's Humanities and Social Sciences Research Ethics Committee, as well as permission from the PMB campus's Disability support Unit,
- Confidential information of participants will be treated with care and kept in a secure computer file with a password. The information will be kept for a period of 5 years. Moreover, the disposal of the important information of this research will be mainly

guided by the University policies. The data will be destroyed by being shredded and thrown in a paper destruction service bin

- If you agree to participate please sign the declaration attached to this statement (a separate sheet will be provided for signatures)
- I can be contacted at: School of Religion Philosophy and Classics, University of KwaZulu-Natal, Pietermaritzburg Campus, Scottsville, Pietermaritzburg.
- Email: 216017520@stu.ukzn.ac.za;
- Cell: 0662535190
- My supervisor is Dr. Patrick Aleke who is located at the ST. Joseph's institute. Contact details: dean@sjti.aca.za Phone number:

The Humanities and Social Sciences Research Ethics Committee contact details are as follows: Research Office, Email: HSSREC@ukzn.ac.za

Phone number 0312604609

- Thank you for your contribution to this research.
- DECLARATION
- I *(full names of*
- *participant)* hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.
- I understand that I am at liberty to withdraw from the project at any time, should I so desire. I understand the intention of the research. I hereby agree to participate.
- I consent / do not consent to have this interview recorded (if applicable)
- SIGNATURE OF PARTICIPANT DATE

Appendix 2

: Interview Schedule

1. From your own experiences what are the different technological advancements to assist you in your personal life
2. What kind of technological advancements (assistive devices or software's) that have an impact in your life?
3. Have the technological advancements been useful in your...?
    a. Primary school?
    b. Secondary school?
    c. Tertiary institution.
4. How has technology played a role in your school environment? was it inclusive and accessible to you as a person living with a special visual need?
5. What challenges were created by not having the correct and effective devices in your school and society?
6. How did you cope or adapt to these challenges?
7. Is there any department or sector that has assisted you with useful devices or software's to improve your life?
8. How has artificial intelligence, devices and software programs assisted you in your community?
9. What forms of assistive devices do you receive currently? What impact do they have?
10. What challenges do you face with adapting to the changes of the updated assistive devices and the changing modern world?
11. What kind of challenges did you face before receiving your current useful and necessary devices in your…?
    a. Society
    b. School/institution
12. what implications or challenges does assistive devices cause in your life? how do you deal with these challenges?

13. how has accessing study material and information been made easy for students with special visual needs? How has this been made possible?

14. How has your interaction with community members been effective by assistive devices? Do community members understand these devices? What encouraging experiences have you encountered? What undesirable experiences have you encountered? How do you think this can be improved?

15. What accommodation challenges have you encountered due to not having proper devices in your school or community? how can these challenges be improved?

16. What can be some of the different challenges of adaption? how can these challenges be improved?

17. What are some of the opportunities created by the invention of assistive devices while assisting students with special needs …?

18. Do you find the improvements of assistive devices relevant and effective in creating a promising society for all?

Thank you very much for your patience and time.

Appendix 3

Questionnaire

1. Please select your gender
    - Male
    - Female
    - Other
2. Age group
    - 18 to 21

- 22 to 25
- 25 to 30
- 30 and above

3. Level of study
    - under graduate student
    - Post graduate
4. Type of high school
    - Special needs school
    - Mainstream school
5. Are you able to deal with the societal issues due to assistive devices?
    - Agree
    - Disagree
6. Have the technological advancements been useful in your...?

d. Primary school?

e. Secondary school?

f. Tertiary institution

7. Do you find it easy to compete with other learners and students with your assistive devices?
    - Yes
    - No
8. Do you find it easy to use the different assistive devices?
    - Yes
    - No
9. What social setting are you from?
    - Rural area
    - Urban area
    - township