

UNIVERSITY OF KWAZULU-NATAL

**Promoting Inclusive Learning through Universal Design of Instruction (UDI): Exploring
the Potential of UDI to Enhance Learning for Students with Visual Disabilities in the
Classroom**

By

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Declaration

I, JAYSHREE SINGH, declare that

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Acknowledgement

This thesis was a culmination of a journey toward a PhD qualification that was accomplished through encouragement, dedication, hardships, endurance, trust and commitment. As I find myself experiencing fulfilment, I realised that a great many people, including family and friends, have contributed to this huge achievement.

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act
AHEAD	Association on Higher Education and Disability
AIFO	Amici di Raoul Follereau
CPED	Centre on Post-secondary Education and Disability (United States)
DBE	Department of Basic Education
DMU	De Montford University
DOH	Department of Health
DPI	Disabled Peoples' International (Italia)
DSU	Disability Support Unit
HE	Higher Education
HEI	Higher Education Institution
HEOA	Higher Education Opportunities Act
IT	Information Technology
KZN	KwaZulu-Natal
LDCs	Least developed countries
MOOCs	Massive Online Open Courses
NICD	National Institute of Communicable Diseases
NSFAS	National Student Financial Aid Scheme
POE	Post Occupancy Evaluation
PWDs	Persons with disabilities
RTI	Responsiveness-to-intervention
SWDs	Students with Disabilities
SWVDs	Students with Visual Disabilities

UConn	University of Connecticut
UCT	University of Cape town
UD	Universal Design
UDI	Universal Design of Instruction
UK	University of Kentucky
UKZN	University of Kwazulu-Natal
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities
WHO	World Health Organisation

Abstract

Globally, there is an abundance of research on the Universal Design of Instruction for students with visual disabilities in universities in developed countries, yet there remains a paucity of such research and practice in a South African setting. There has been a steady increase in the number of students with disabilities in Higher Education Institutions in South Africa, with a significant number of students with visual disabilities. The study therefore capitalised on this gap and examined the potential of the Universal Design of Instruction to promote epistemological access for students with visual disabilities in the classroom within a Higher Education setting in order to maximise learning outcomes. The study was conducted at the University of KwaZulu-Natal, which has the highest number of students with disabilities in the country. At the time of the study, the institution had approximately 709 students with disabilities, with a total of 204 students with visual disabilities. The study was underpinned by applicable theoretical frameworks which included Systems Theory, Maslow's Hierarchy of Needs, Sen's Capability Approach and the Social Model of Disability. A mixed-methods approach was instituted for in-depth research. A census approach was utilised for the quantitative component of the study, which entailed distributing a questionnaire to all students with visual disabilities and those that responded became the sample. The qualitative aspect entailed in-depth interviews with students with visual disabilities and purposive sampling was utilised. The analysis was done using the Statistical Package for the Social Sciences (SPSS 21 Quantitative) and NVIVO 12 (Qualitative) respectively, which produced an array of descriptive and inferential statistics. The results affirmed the dire lack of Universal Design of Instruction in the classroom, which negatively impacted on students with visual disabilities and created barriers to learning. Academic achievement was hence compromised and students felt excluded. The findings clearly indicate that the implementation of the Universal Design of Instruction can alleviate barriers to learning and promote academic outcomes. Through the findings, a conceptual Universal Design of Instruction model for the classroom was proposed, supported by correlations and the lived experiences of students with visual disabilities. Recommendations include high-level interventions, inclusive of Universal Design of Instruction being on the Executive Management Agenda, policy re-formulation, specialised Universal Design of Instruction Committees inclusive of voices of students with visual disabilities, and the re-conceptualisation of classroom and learning spaces. Future research, amongst others, generated from this study can include comparative studies of this nature with other South African Higher Education Institutions, as well as the gaps between developed and developing countries in terms of the Universal Design of Instruction in the classroom.

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Chapter One

Introduction and Problem Statement

1.1 Introduction

The numbers of students with disabilities (SWDs) admitted to Higher Education Institutions are increasing, which complements the Social Model of disability. However, whilst efforts are being made to increase accessibility, little is known about the potential of the Universal Design of Instruction in the classroom to improve access and achievement for students with disabilities. Universal Design of Instruction encourages resourceful and inclusive pedagogy by presenting curriculum design and learning environments which can be fully adapted to accommodate the diversity of students with disabilities at university. The current study therefore capitalised on this opportunity to explore the potential of Universal Design of Instruction in promoting inclusive learning to enhance learning in the classroom within a University setting for students, with a particular focus on students with visual disabilities. This chapter introduces the study and defines the research problem. It further provides a background to the problem based on a brief review of the literature and an overview of the legislation within the context of students with visual disabilities in a South African Higher Education Institution. The aims and objectives are outlined and inform the research questions of the study. An outline of the methodology is presented, as well as the motivation and significant contributions of the study.

1.2 The Problem Statement

Disability is defined by the Americans with Disabilities Act (ADA) (1990) as a physical or mental impairment that substantially limits one or more major life activities. Makoelle (2020) argues that the concept of disability is a social construct and its use is exclusive as it suggests that people with a disability lacked ability. Furthermore, disability was explained to be the

disadvantage or restriction of activity caused by a society that does not acknowledge people who have impairments and thus excludes them from mainstream activity (Disability Definitions, Models and Terminology, 2014). Therefore, Subrayen and Suknunan (2019) recognised disability as a system of discrimination requiring social redress and transformation.

A major theoretical and practical issue that has dominated the field of Disability studies for many years remains the great diversity of disabilities. The World Health Organisation [WHO] (2015) expressed that disability is a complex phenomenon and tackling such complexities required interventions to remove environmental and social barriers. However, despite International, National and Higher Education legislation on anti-discriminatory practices, persons with disabilities continue to experience exposure to social and educational exclusion (Subrayen & Suknunan, 2019; Dutta, 2013 and Rahman, 2019). For many years, students with disabilities (SWDs) have tried to adapt to inaccessible mainstream universities.

Erhardt and Shuman (2015) indicated that students enrolled at institutions in the United States and other nations make up 3 % of the total population of students who disclose disabilities amongst all types of institutions. Therefore, it becomes highly likely that lecturers will encounter SWDs at some point in their careers at Higher Education institutions. Riley (2008) indicated that approximately 49 million Americans over the age of fifteen have some form of disability and that this number is likely to grow. In support, Roberts, Park, Brown and Cook (2011) indicated that diversity in post-secondary education has expanded over the years, creating a need for colleges and universities to re-assess traditional instructional strategies to better meet the needs of an increasingly varied student body.

In light of this, there has been a significant increase in the number of SWDs at the University of KwaZulu-Natal in recent years, which has ignited a need for transformation. Furthermore, it prompted the university to modify its curricula, instruction, assessment and environment to address the needs of SWDs to conform to its core value of promoting inclusiveness (University of KwaZulu-Natal – Vision & Mission, 2019). This implied that in order to retain and educate SWDs, the university needs to ensure that courses are designed within a system that is accessible to the diversity of students within the classroom (Burgstahler, 2013). However, currently there is minimal evidence if teaching and learning in the classroom is cognisant of students with

disabilities and if the principles of the Universal Design of Instruction are being applied to promote inclusiveness in the classroom.

The Universal Design of Instruction (UDI) motivates the development of teaching methods and strategies that are innovative, effective and efficient (The Higher Education Opportunities Act [HEOA], 2008). Robertset al. (2011) argued that although UDI is a relatively new framework in post-secondary education, it has generated significant support. Universal Design of Instruction is a catalyst in bringing about flexibility and creativity to instructional methods, allowing SWDs to gain knowledge by taking advantage of their strengths. This included awareness initiatives, professional development, customised and general technical assistance, workshops and training in the use of assistive and educational technology (HEOA, 2008). As such, Singh (2017), Brandt (2011) and Harbour and Madaus (2011) stipulated that Universal Design of Instruction encourages resourceful and inclusive pedagogy and takes into consideration the diverse learner by providing appropriate accommodations to enhance the classroom environment to meet the particular needs of SWDs. Such research now generates an inquiry as to how Universal Design of Instruction can be applied in the South African Higher Education setting to improve and integrate an inclusive focus thereof.

As such, the UDI curriculum must reflect awareness that each learner is unique, as well as the need to address such differences. Guided by the above, this study aims to apply the seven principles of universal design in the classroom outlined by The Centre for Universal Design (1997):

- Equitable use;
- Flexibility in use;
- Simple and intuitive use;
- Perceptible information;
- Tolerance for error;
- Low physical effort; and
- Size and space for approach and use.

This study therefore exploits this gap in inclusive learning in the classroom through UDI, with a particular focus on students with visual disabilities (SWVDs). Visual disability is a generic term

used to describe a wide range of visual problems (Rahman, 2019). It includes categories such as total blindness, mild and severe cases. The way the learner uses their residual vision is the main concern of educators. Based on the educational definition of visual impairment, completely blind refers to severely challenged students who are skilled in the use of Braille to interpret information (Rahman, 2019). Low vision students in contrast, use their residual vision as a basis to deal with visual demands concerning suitable assistive devices. As at 2019, at the onset of the study, there were 709 SWDs at the University of KwaZulu-Natal (UKZN), 204 of which were students with visual disabilities (SWVDs). This revealed that SWVDs made up a strong number of the total number of students with disabilities (Disability Support Unit (DSU), 2019). Therefore, a specific focus on SWVDs was motivated by the significantly higher number of these students amongst the growing number of SWDs at the university. Furthermore, learning, specifically for SWVDs, is greatly hindered and compromised due to their inability to see within a classroom designed for sighted students. As such, this study focused primarily on students with visual disabilities in the classroom to find ways to help maximise learning outcomes, be less stigmatised, find a sense of belonging and counteract all the challenges experienced in the classroom that prohibit them from achieving what they are capable of academically.

Based on the aforementioned principles, the study proposes to corroborate that UDI can facilitate/maximise learning outcomes for students with visual disabilities in the classroom and addresses the issue of inclusion, making the successful education of SWVDs a priority.

Many universities still apply outdated teaching and learning methods where the presentation of the lecture is predominately through projector slides and the chalkboard/whiteboard with the expectation that everybody understands. Tomozii and Topală (2014) supported the argument that current teaching and learning were outdated due to the lack of new and creative educational designs, such as the Universal Design of Instruction in the classroom that this study tries to promote. Hence, universities need to adapt to change because historic education systems did not meet the requirements for diverse groups such as the SWVDs it supports today. It is for this reason that this study embarked on the exploration of a highly recognised model that has been implemented in other countries globally to tackle such a problem. The Universal Design of Instruction framework is relatively new and has engendered momentous support as an instrument worth exploring to foster inclusion and to find solutions to the problems/challenges confronted by

SWVDs in the HE classroom (Izzo et al., 2008; Embry, Parker, McGuire and Scott, 2005 and Rickerson & Deitz, 2003).

A comprehensive literature search using electronic and library resources revealed a lack of evidence on whether UDI is being applied in African HE. This lack of evidence stems from the paucity of research that exists on the incorporation of UDI in contributing to effective strategies for inclusive education in the HE classroom in Africa. In South Africa presently, it is primarily the University of Cape Town that is attempting to harness the potential of UDI. Hence, there is a need for this to be explored or expedited. The study capitalised on UKZN as the primary HE institution of enquiry due to its large number of students with disabilities, particularly students with visual disabilities.

Benchmarked against other international institutions such as the University of Connecticut (Harbour & Madaus, 2011) and the University of Washington (Burgstahler, 2013), amongst other leading Universities in the world who have successfully implemented UDI, UKZN is not UDI compliant in the classroom and needs to explore the potential of becoming compliant to facilitate/maximise learning outcomes for a growing number of SWVDs. As such, several studies were consulted in order to substantiate the benefits of its implementation at UKZN. Studies by Gallego and Busch (2015) and Marimuthu and Cheong (2015) concur that there is a dire need for changes in the classroom that demand more positive beliefs and a greater commitment from the academics and professionals as there remains inconsistencies as to how accommodations are made use of, resulting in the lack of equal access to education and low retention of SWVDs.

The study will contribute to the gap in the extant body of knowledge as it intends to make a 'very unique' contribution through its area, methods, statistics and results in a South African setting. The study further intends to conceptualise a UDI model for implementation in the mainstream classroom supported by statistical correlations and the lived experiences of students with visual disabilities (SWVDs). Implications of such will be various policy and practice contributions to many stakeholders in South African Higher Education Institutions. Furthermore, the study addresses the issue stipulated in Article 26 (1) of the United Nations Declaration of Human Rights [UNDHR], (1948) that focuses on the right to education, accessible higher education and the development of the human personality. Organisations such as the Association on Higher

Education and Disability (AHEAD) have recognised the importance of UDI (Roberts et al., 2011). Furthermore, The Higher Education Opportunity Act of 2008 described it as a "scientifically valid framework for guiding educational practise" (Roberts et al., 2011: pg.7). The above legislation consulted supported the study in exploring the potential of the Universal Design of Instruction in promoting inclusive learning to enhance learning for SWVDs in the HE classroom.

1.3 Preliminary Literature Review and Background

One can imagine that a life without sight can be quite daunting and challenging, and is therefore one of the most feared conditions (Rahman, 2019). Visual impairment influences students' development, learning, mobility, social growth and adjustment. As a result, SWVDs present unique educational needs which are best addressed early in life with a focus on concepts development, improving listening skills, and developing study and research skills (Rahman, 2019). The study launches an inquiry into existing knowledge, which entails a critical review of prior research that motivates and justifies research that entails the possibility of the implementation of UDI in the classroom to enhance learning capabilities and outcomes for students with visual disabilities (such as research conducted by Haegele & Hodge, 2016; Zajadacz, 2015 and Burgstahler, 2018, 2017 & 2015). The evolutionary shift of disability to the new Human Rights Model compelled the study to consult current policies in relation to the target population of SWVDs under investigation. Dutta (2013) rationalised that inclusive education should facilitate access to the same information, at the same time and possibly in the same way to promote the involvement of SWVDs in mainstream classroom settings. This study strongly agrees with Dutta (2013) that SWVDs face barriers to learning and that HEIs should break down these barriers through tactile resources to further promote inclusion. Consequently, backed by researched evidence, this study proclaims that the flexibility of a design such as UDI enables SWVDs to participate in activities they have not previously been able to do (Dutta, 2013).

The concept of universal design was introduced by American architect Ronald Mace, who defined it as an attitude as well as an approach to design a system to be "usable by everyone to

the greatest extent possible” (Heylighen, 2014: pg. 2). It is expected that in considering UDI, unforeseen problems will be encountered. **The direct experiences of designers in determining what is designed can serve to inform who designs the environment.** In most cases, designers are inexperienced and do not personally understand what it must feel like to have a disability such as being blind, which can have significant implications for its application.

Universities are required to take reasonable approaches to planning for the implementation of UDI. For instance, the traditional classroom at the university needs to be assessed to determine whether it requires the re-design of existing lecture rooms/classrooms according to UDI, or the creation of a new one (Burgstahler, 2018). Furthermore, Burgstahler (2018) suggests that tackling the issue of the implementation of UDI in the current classroom setup required deliberate, small steps towards this goal to ensure that it is attainable. In line with this study’s intention Ferreira and Sefotho (2020:pg102) agreed that focus should be placed on “what is already present and available and what is already being done”. It is equally important that all stakeholders challenge attitudes and perceptions and remain cognisant that the benefits of an inclusive society far outweigh the losses.

This research topic draws on information based on a multitude of methods that have been explored in terms of how UDI can be incorporated into HE in terms of how it assists SWVDs in the classroom, and how it facilitates teaching and various forms of assessment methods. This was done through a comparative overview of UDI in Developed and Developing Countries. Munene (2017) revealed that the external environment in which HE institutions operated was continuously changing. As such, this study attempts to convince the university that a goal to provide classroom environments with greater accessibility for SWVDs is a much needed intervention to promote inclusivity in keeping with current trends and transformation at HEIs.

Several scientific research outcomes have suggested that progress has been achieved (De Montfort University, 2019; Munene, 2017; Bhattacharya, 2017). Inclusive education in high-income countries and many low-and middle-income countries have implemented accessibility policies and are reaping the benefits. This study embarks on an extensive global search to improve current perspectives on how to introduce inclusive education practices for SWVDs in the classroom by focusing on the values of diverse societies and their logical co-existence with

SWDs (Schiemer, 2017). It was observed in studies such as De Montfort University (2019); Munene (2017) and Bhattacharya (2017) that the implementation of accessibility standards evolved and they are well implemented in some countries that appear to be beyond the reach of countries like South Africa because of their limited resources and inadequate enforcement and adherence to policy. What the university requires is a universal design system that ensures that learning and instruction are inclusive and presented in flexible formats in every classroom. To increase the epistemological access and independence of SWVDs and all students within the classroom UDI implementation is appropriate in creating instructional goals, techniques, materials and assessments that are appropriate for each person (Black, Weinberg & Brodwin, 2014).

A close examination of relevant literature depicted the Universal Design of Instruction (UDI) as a relatively new framework in Higher Education. This included studies by Izzo, Murray and Novak (2008); Embry et al.(2005); and Rickerson and Deitz (2003). Other studies consulted included Singh (2017); Brandt (2011) and Harbour and Madaus (2011), where the Universal Design of Instruction encouraged innovative and inclusive pedagogy that considers the unique learner. This was found to be consistent with the Republic of South Africa, Department of Higher Education and Training [RSA, DHET] (2013). In addition, the study explores a universal design system based on the Higher Education Opportunity Act (2008) and the United States Department of Education's National Education Technology Plan (2010), where it was emphasized that UDI was a framework that benefited all learners. The researcher consulted legislature such as the United Nations (UN) Convention on the Rights of Persons with Disabilities [UNCRPD] which promotes research into and the development of universally designed products, services, materials and facilities, as well as promotes universal design in the development of values and strategies to be applied in the classroom situation. Moreover, the study embraced the idea that UDIs a philosophy included the widest possible range of SWVDs with functional capabilities that did not require assistive technologies. Several universities such as the University of Washington (Burgstahler, 2018) and the University of Connecticut (Harbour & Madaus, 2011) have applied UDI in providing curriculum design and educational environments that are adapted to accommodate the overall diversity of students. As such, adherence to the set principles of the universal design approach could propel the university to the next level in the transformation towards greater epistemological accessibility for SWVDs.

There is an abundance of research on UDI in Higher Education in developed countries, along with other developing countries around the world raising important questions about UDI and its implementation in classrooms and educational systems in the USA and globally (Dalton et al.,2012). Based on such studies,the general question arises of why there is such a paucity of Universal Design Systems in HEIs within a South African context. Based on various Internet searches via the academic search engines strategies that incorporate UDI in Higher Education,South Africa has not been adequately researched nor are there similar studies of this nature across the continent of Africa itself. As a result, it is apparent that conducting a study that fulfils the listed objectives and answers the research questions proposed would contribute to closing the gap in UDI research in African HEIs and add value to the research area, as well as to be the first of its kind to examine UDI as a proposed model for SWVDs in the classroom at a South African University. Africa is a developing continent and it is imperative to identify the need to employ strategies that incorporate UDI in Higher Education, placing the country at a competitive advantage in the global sphere.

1.4 Motivation for the Study

There is an increasing number of students with visual disabilities (SWVDs) pursuing educational opportunities at the Higher Education level. As a result, the importance of accessibility to education increases. Equal access should become the central goal as everyone requiring higher education has a constitutional right to do so comfortably and efficiently. This study is empirical and motivates the incorporation of a universal design curriculum to promote the epistemological access to learning for SWVDs stemming from work-related experiences that the academic sector of the university does not understand nor takes into account the needs of SWVDs. The University of KwaZulu-Natal is currently not UDI-compliant in the classroom and that is why students with all disabilities (let alone visual disabilities) are compelled to access the Disability Support Unit for reformatting of their notes and to even access disability accessible LANs with accessible technology (built by the Support Sector).Therefore, there is a dire need to explore the potential of applyingUDI principles in the classroom to maximise learning outcomes for students with visual disabilities.

Exploring UDI for implementation provides an important opportunity to advance the understanding of problems and challenges concerning knowledge delivery and learning as research has consistently shown that SWVDs lack adequate interventions to ameliorate their full participation within HEIs (Singh, 2017; WHO, 2015; Denzin & Lincoln, 2013). This study will explore new avenues towards providing the most suitable foundation for embracing transformation and greater accessibility and more opportunities for students with visual disabilities in the classroom at a prominent institution of Higher Education (University of KwaZulu-Natal) in South Africa. This study is driven by the researcher's professional experience in working with SWVDs for many years at UKZN. With acquired first-hand knowledge and expertise in the field of disabilities, the researcher embraces the challenge to make a significant contribution to the improved accessibility and universality of educational instruction and learning at a HEI in South Africa.

1.5 Importance of the Topic

A critical review of prior research is used to motivate and justify the research and provide something new that makes a significant contribution to knowledge concerning students with visual disabilities at a Higher Education Institution (HEI) in South Africa. There is minimal research from an African and South African Higher Education context when it comes to UDI in Higher Education institutions from a learning focus.

1.6 Aims

This study aims to examine the incorporation of the Universal Design of Instruction in the classroom within a higher education setting to enhance learning outcomes for students with visual disabilities. As such, this will be informed by a variety of objectives to fulfil the aim, as outlined in the next section.

1.7 Objectives of the Study

The objectives of this study are:

- I. To examine the experiences of students with visual disabilities in relation to current teaching practices in the classroom;
- II. To determine the challenges experienced in learning for students with visual disabilities in the classroom;
- III. To explore the potential of UDI implementation to facilitate/maximise learning outcomes for students with visual disabilities in the classroom;
- IV. To identify factors that can influence the implementation of UDI for inclusive learning for students with visual disabilities in the classroom; and
- V. To propose a conceptual model that can incorporate UDI to promote learning outcomes for students with visual disabilities.

1.8 Research Questions

1.8.1 The Main Research Question

- How can Universal Design of Instruction promote epistemological access for students with visual disabilities in the classroom?

The study will utilise a series of sub-questions to address the research question.

1.8.2 Sub-Questions

- I. What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?
- II. What are the current challenges in learning for students with visual disabilities in the classroom?

- III. How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?
- IV. What factors must be considered for the implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom?
- V. What type of model can be conceptualised to incorporate UDI to promote learning outcomes for students with visual disabilities?

1.9 Significance of the Study

The study is primarily about utilising Universal Design of Instruction (UDI) principles to include students with visual disabilities in knowledge delivery in the classroom in order to promote equal access to education. In other words, it does not matter what discourse is being used in the classroom, but its compliance with UDI principles and what can be done to improve compliance is important. With the potential absence of UDI incorporation in the classroom, backed by experience and knowledge from the students and support sector perspective, the study becomes significant through its area, methods, statistics and results of enquiry. The study further intends to conceptualise a predictive UDI model backed by the lived experiences of students with visual disabilities. The implications of such will be various policy and practice contributions within the Higher Education environment institutionally, nationally and/or internationally.

1.10 Theoretical Frameworks underpinning the Study

The intended research embodies a multitude of concepts, given the research problem, through the analysis of principles and paradigms of selected models of disability. The applied models include the Social Model (Zajadacz, 2015), Systems Theory (Becvar & Becvar, 2014) and Maslow's (1943/54) Hierarchy of needs. Furthermore, to achieve educational enhancement, the study will also apply Sen's Capability Approach. Theories that were not applied to Disability previously were applied in this study, proclaiming it to be unique. The selected models are applied in this study to provide a basis for a new framework that supports the Universal Design of Instruction. The concept of universalism will thus materialise through this process.

The Social Model takes the view that if a certain disorder cannot be modified, then outside situations need to be adapted or else SWVDs may experience **stigmatisation** and feel of less value to society if seen only from the perspective of their dysfunction (Zajadacz, 2015). The Social Model of Disability could provide possibilities to create an all-inclusive learning environment that promotes equivalent opportunities for all (Shava, 2008). Accordingly, this study draws on the fundamental elements that the Social Model presents on the removal of barriers and its role in increasing the quality of life for SWVDs.

Aspects of Abraham Maslow's (1943, 1954) Hierarchy of Needs Model embodied relevance to the current study. The significance of Maslow's Hierarchy of Needs offers a framework for changing the tradition within the university that prioritises addressing higher-order needs related to the inclusion and incorporation of SWVDs in the higher education classroom (Jackson, Santoro, Ely, Boehm, Kiehl, Anderson & Ely, 2014).

In addition, the use of Systems Theory was found appropriate as it encompassed collaborative working in a system which relates to the university environment. Systems Theory embraced inclusion, working collaboratively and reciprocal relationships (give and take actions) that embrace shared responsibility with regard to the provision of equity and equality of education for SWVDs in the classroom.

Furthermore, the study applied the Capability Approach formulated by Amartya Sen (1985-1989) and advanced by Martha Nussbaum, which focused on ensuring equal opportunity and developing human potential (Broderick, 2018). This study proposes to enhance capabilities by introducing UDI and embracing the view that human development was a "participatory and dynamic process" not primarily concerned with basic need satisfaction (Alkire, 2010: p.5). The Capability Approach is appropriate in this study as it promoted human diversity and allowed for human flourishing (Broderick, 2018).

1.10.1 Paradigms, Ontology and Epistemology of the Study

This research was a joint endeavour between researcher and participants where the experiences of students with visual disabilities provide invaluable insights into current challenges within the system (Vianna & Stetsenko, 2014). Therefore, the following was considered:

- **Ontologically:** the researcher believed that reality is socially constructed and that the world is not just given to one in its status quo. Instead, the world is seen as historically evolving, continuously changing and constantly working collaboratively to contribute to the unique ways of social beings (Vianna & Stetsenko, 2014).
- **Constructivist/interpretive paradigm:** The research paradigm encompassed the social constructivist/interpretive paradigm of understanding the world as others (students with visual disabilities) experience it (Wagner et al., 2012).
- **Epistemologically,** the process of knowing is highly dependent on active participation and working collaboratively towards transformation (Vianna & Stetsenko, 2014). Within the transformative paradigm, the research maintained that the truth obtained from the participants can be used in practice to empower and transform the lives of SWVDs.
- **Quantitative aspect:** Furthermore, the study used a combination of research techniques that involved a quantitative aspect in an attempt to rationalise myths and empower people to change current social viewpoints (Social Model).
- **Qualitative methods:** Through qualitative methods, the research study focused on a transformative/emancipatory paradigm that tested the dual understanding aimed at the multiple realities of both researcher and participant.

1.11 Research Methods / Approach to Study

The study applies a mixed-methods approach that uses a combination of quantitative and qualitative research methods. The research will strengthen its plausibility by applying a mixed-

methods approach as this allows for the validation of results by a combination of methods, and describing research data more comprehensively.

1.11.1 Population

The University of KwaZulu-Natal became the chosen location for the study because the institution had the highest number of enrolled students with disabilities and hence provided an ideal environment to explore avenues for advancement, accessibility and equal opportunities, as well as to produce research-based information that can assist students with visual disabilities. At the time of the study, the institution had 709 students with a disability, with a total of 204 students with visual disabilities (Disability Support Unit, 2019).

a) Census and Sampling

- **Quantitative**

The quantitative component will involve all students with visual disabilities across the university. The researcher adopted a census method of data collection targeting all students (204) with visual disabilities. Whoever responded became the census sample.

- **Qualitative**

The qualitative aspect was supported with interviews capturing the experiences of Students with Visual Disabilities regarding UDI in the classroom. Convenience and purposeful sampling techniques was used, comprising in-depth interviews targeted towards 20 students with visual disabilities. Fifteen volunteered to participate in the study to detail their lived experiences of epistemological access to the curriculum across all four campuses.

1.11.2 Data Collection Methods and Instruments

All instruments were built around the study's research questions, UDI principles and theoretical models to allow for effective underpinning of the models. Due to COVID-19 protocols, questionnaires and invitations to participate in the interviews were distributed electronically with assistance from the Disability Coordinator.

b) Quantitative

A questionnaire built on Likert scales was used to extract statistical information. This data collection approach was found suitable for study in acquiring information from a large group of students with visual disabilities within a relatively short period. The data collection process involved the administration of questionnaires to these students in appropriate formats for increased accessibility and understanding. Questionnaires were made available to students via an online tool known as Google Forms ® with the distribution of an online link to the population of students with visual disabilities.

c) Qualitative

The qualitative component comprised 15 interviews with SWVDs. Due to COVID-19 protocols all interviews were conducted telephonically or via electronic means, including Zoom platform or cell phones. Disability Coordinator assisted with the distribution of the invitation to participate in the interviews to SWVDs via email and Whatsapp. As such, interviewees were contacted on their cell phones and the interviews recorded by means of equipment referred to as a virtual Dictaphone/recorder. Consent and ethical issues were explained and recorded, obtaining consent via this process. An interview schedule conveyed open-ended questions targeting the views of SWVDs based on their individual lived experiences in their classrooms.

1.12 Data Analysis

1.12.1 Quantitative

The gathered data was analysed and interpreted using quantitative techniques and advanced statistical methods. This included Reliability testing, Descriptive statistics, Pearson's Chi-Square analysis and Correlations. These tests are all possible and attainable through specialised software and by the use of statistical systems such as SPSS 21.

1.12.2 Qualitative

The analysis of qualitative data utilised thematic analysis based on qualitative techniques such as word clouds, cluster analysis, tree mapping and hierarchy charting, which was available via NVIVO 12 analysis software. This was coupled with the researcher's interpretation, thereby expediting a thematic interpretive approach.

1.13 Ethical Considerations

This study ensured that all ethical principles were adhered to. The research was conducted in line with UKZN's ethical standards for research and involved obtaining ethical clearance from the Humanities and Social Sciences Research Ethics Committee. A Gatekeeper's letter from UKZN was obtained. Informed consent was an important process followed throughout the research where participants were free to contribute to the study at will. Anonymity and confidentiality were strictly maintained during the data collection process and ensured no physical, emotional, psychological or reputational damage to the participants. COVID-19 protocols were strictly adhered to and alternative methods for data collection were applied, ensuring the safety of all participants in the study. Therefore, face-to-face interviews and the dissemination of questionnaires to SWVDs were carried out via electronic means. Ethical considerations are discussed in detail with respect to research involving human subjects in Chapter Four (Methodology).

1.14 Contribution of the Study

The study seizes the opportunity to make a range of significant contributions by providing original work through empirically acquired evidence done independently. The study intended to make the following contributions:

- Provides something novel by evaluating the epistemological challenges of SWVDs in the classroom at a HEI in South Africa and making a significant contribution to knowledge in this area;
- Provides clear and explicit evidence, substantiation and inference;
- Demonstrates intellectual maturity that reflects articulated critical thinking that provides insight;
- Encourages awareness of the evolving nature of Disability, the implementation of UDI and the impact of the delivery of education, inclusivity and challenges of students with visual disabilities;
- Increases understanding of the lived experiences and challenges of SWVDs relative to other stakeholders within the university environment;
- Uncover new data acquired from studies to enhance adherence to policy, improve teaching, gaining knowledge, and to discover new avenues such as UDI implementation to enhance inclusivity; and
- Proposes a conceptual model that incorporates four applicable theoretical frameworks aligned with the principles of UDI that explores a universal approach to curriculum design, reasonable accommodation and the modification of existing teaching and learning methods in the classroom.

1.15 Chapter Overview

The research study consists of eight chapters, as follows:

- **Chapter 1** featured the introduction and problem statement. It provided a background to the problem based on a brief review of the literature as well as a legislative context for SWVDs

in a South African HEI. It also introduced the UDI concept. The aims and the objects are outlined and the research questions and motivation for the study are provided. It contained a brief overview of the methodology and explained the contributions of the study.

- **Chapter 2** comprises of the review of literature. This chapter expands on the review of literature, global and current legislature and explored UDI and its implementation in developed and developing countries. It explains the complexities involved in UDI implementation, discusses visual impairment within the context of the HE and how successful and strategic implementation of UDI can enhance learning outcomes for SWVDs in the classroom.
- **Chapter 3** describes the theoretical frameworks that underpin the study, namely Systems Theory and Maslow's Hierarchy of Needs, Sen's Capability Approach as well as the overarching influence of the Social Model of Disability.
- **Chapter 4** describes the research methods intended to fulfill the study. In light of the mixed-method approach that was undertaken, both qualitative and quantitative data collection techniques and instruments are clarified. The research design sampling strategies are detailed and respondents are introduced. It further describes the location and emphasises the ethical considerations applied in the study.
- **Chapter 5** consists of the qualitative analysis and discussion. A detailed discussion of the qualitative findings is presented with empirical evidence from actual dialogues of SWVDs. The data is analysed in relation to the literature and theoretical understandings that underpin the study. The analysis of data will apply qualitative techniques that include a thematic analysis to understand the perceptions and lived experiences of SWVDs in detail.
- **Chapter 6** provides the quantitative analysis and discussion. This chapter focuses on quantitative analysis and discussion using descriptive and advanced inferential statistics. The data analysis verified findings in relation to the research questions and motivated the application of the theoretical frameworks.
- **Chapter 7** features the triangulation and model formulation. This chapter explores the results of the study in relation to the research questions. It triangulates the quantitative and qualitative results to support the findings and explores the applicability of the theoretical frameworks in conjunction with UDI principles. Furthermore, the frameworks underpinning the study are applied via the results of the study to inform the new conceptual model.

- **Chapter 8** provides the conclusion, recommendations and limitations of the study. This chapter is the final chapter. A recap of the research questions and objectives is used to assess whether the study fulfilled its intended purpose. Furthermore, based on the study's findings recommendations will be presented with directions for future researchers and limitations. This chapter summarises and concludes the research and draws the study to a close.

1.16 Chapter Summary

This chapter introduced the study and delivered the research problem. It provided a background to the problem primarily based on a brief overview of the literature and legislation in the context of students with visual disabilities in a South African university. It presented the research question, sub-questions and objectives that stemmed from the research problem. The aims and objectives were outlined and informed the research questions of the study. The concept of Universal Design of Instruction and its principles were introduced and a brief overview of the applied theoretical frameworks was provided to give insight into the study's underpinnings. An outline of the methodology was presented, as well as the motivation and significant contributions of the study. This chapter also provided the reader with a brief overview of what each chapter entails. The next chapter provides a comprehensive review of literature, relevant legislation and theories that form the support structure of the study.

Chapter Two

Literature Review

2.1 Introduction

Everyone, including SWVDs, pursues educational opportunities at all levels and should, by all means, be able to do so comfortably and efficiently. This chapter reviews literature that considers SWVDs as part of society with equal rights to education. Furthermore, it discusses the concepts of visual impairment experienced by university students at UKZN. The literature covered a wide variety of theories from around the globe, all of which align with the seven principles of UDI in response to the study's objective to prepare the university to accommodate everyone, including SWVDs. Students with visual disabilities must feel welcomed by being able to manoeuvre within the institution, communicate effectively, access printed materials/electronic resources and fully participate in events and other activities. Many theories have been consulted to explain the relevance and importance of inclusivity and equal access.

A broad perspective of Universal Design of Instruction was obtained through a comparative overview of UDI in developed and developing countries. The information obtained related to evolving standards and various types of disability systems. A wide variety of legislation was consulted to understand how inclusive education in high-income countries and many low and middle-income countries have benefited from adopting accessibility policies. The analysis of literature that embodies progression in developed country universities informs how South African universities can ensure that they remain competitive on a continental and global scale. There is an abundance of research on UDI in Higher Education around the world, raising important questions about UDI and its implementation in the classroom. The current study explores efforts applied nationally and internationally to understand the implementation of UDI, some of which conformed to ways to reduce existing gaps in the implementation of policies that are specific to South Africa.

Due to the nature of the study, the literature review will adopt a *contextual layout approach*.

2.2 Defining Key Concepts and Terminology

Universal design principles are being applied to educational settings worldwide (Roberts et al., 2011). This led to an array of terms emerging, which are sometimes used interchangeably in literature to describe this system. The most prominent terms are Universal Design of Instruction (UDI), Universal Design for Learning (UDL) and Universal Instructional Design (UID). Albeit the different terms, each alludes to the application of UDI principles in the educational setting (Roberts et al., 2011). The term UDI is used throughout this project and includes all related terminology. The term 'inclusive pedagogy and accessibility' pertains to epistemological access to the higher education curricula where students with visual disabilities have equal access to educational dissemination. For example, Brailled scripts given by lecturers in classrooms and screen reading software on every computer in schools.

Universal Design of Learning was defined in The Higher Education Opportunities Act (HEOA) (2008) as follows:

"Universal Design for Learning is a scientifically valid framework for guiding educational practice that (A) provides flexibility in the ways information is presented, in the ways students respond to or demonstrate knowledge and skills, and in the ways, students are engaged; and (B) reduces challenges in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient."

Universal Design of Instruction (UDI) motivates the development of teaching methods and strategies that are innovative, effective and efficient (HEOA, 2008). The inclusion of such a definition in the first federal legislation of the United States HEOA (2008) demonstrated the escalating importance of the inclusion of UDI at HEIs (Izzo, 2012). Roberts et al. (2011) argued that although UDI is a fairly new framework in post-secondary education, it has generated substantial popularity. Universal Design of Instruction is a catalyst in bringing about flexibility

and creativity to instructional methods, allowing SWVDs to acquire knowledge by capitalising on their strengths. The Higher Education Opportunities Act (2008) insisted that all staff, administrators and academics are provided with the skills and support necessary to meet the needs of SWVDs. This included awareness initiatives, in-service training, professional development, customised and general technical assistance, workshops and training in the use of assistive and educational technology (HEOA, 2008).

The United Nations (UN) Convention on the Rights of Persons with Disabilities [CRPD] also promotes research into and the development of universally designed product and services, materials and amenities, as well as promotes universal design in the development of standards and guidelines. As such, Singh (2017), Brandt (2011) and Harbour and Madaus (2011) stipulated that the Universal Design of Instruction encourages resourceful and inclusive pedagogy by presenting curriculum design and learning environments which can be fully adapted to accommodate the diversity of students with disabilities at university. Such research has generated an inquiry into the application of the Universal Design of Instruction (UDI) at a South African university (such as UKZN) to enhance the inclusive focus that the university strives towards.

It is necessary at this juncture to clarify what is meant by accessibility, another term widely used in disability studies in the higher education sector. The study adopts the definition of a current theorist regarding the term 'accessibility', which focuses on "removing barriers to participation and engagement in online experiences and the degree to which someone can access an online resource regardless of their disability, technology or environment" (Ngubane-Mokiwa, 2016: np). This study also supports the version stated in Ngubane-Mokiwa (2016) that accessibility is about "the usability of a product, service, environment or facility by people with the widest range of capabilities", which ties in with UDI principle number 2: Flexibility in use, in addition to UDI principle 1: Equitable use, where accessible means that the design can be adjustable to suit the needs of all learners.

Ngubane-Mokiwa (2016) outlines five perspectives that describe accessibility. These include:

- I. Presentation methods;
- II. Control methods;

- III. Access models such as UDI;
- IV. Learner support; and
- V. Availability of equivalent alternative content, formats and activities.

The alternative formation may include audio-recordings and the learning environment is always compatible with assistive technologies/devices used by SWVDS such as narrators, scanners, enlargement, voice-activated technologies, Braille, and other devices to access education (Ngubane-Mokiwa, 2016).

Disability is seen as universal, based on the "WHO Global Disability Action Plan 2014-2021"(2015). This implies that as people get older, everybody can experience disability either directly or indirectly at some point in their life. In support,the Italian Association Amici di Raoul Follereau (AIFO) and Disabled Peoples' International Italia (DPI Italia) (2006) explained that in designing environments for educational and other needs,it is essential to consider personal elements that might hinder the efficiency of the action. This training manual is derived from the experiences and ideas of the national training seminar on Emergency and Universal Design (AIFO and DPI Italia, 2006). It is important to note that in life,disability can be experienced in some form either temporarily or permanently, as a result of an accident,getting old or experiencing it in varying situations.

Makoelle (2020) conveyed that disability and special needs are debatable concepts. He explained that disability is a social construct that gave rise to the question of who is deemed disabled. Furthermore, it meant that a person with a disability lacked the ability, and that is exclusive. It is from here that the term differently-abled became **accepted** as appropriate. Special needs were also declared unsuitable as one could argue that all the needs of students in a classroom were special (Makoelle, 2020). When designing a university,universal design plays a role as a framework where products or materials are usable without modifications or additional interventions (AIFO and DPI Italia, 2006).

Universal Design of Instruction (UDI) is designed to allow the university to expect that there will be diverse student needs and learning styles, and to be prepared with effective strategies to make learning accessible to all students (Burgstahler, 2015). Furthermore, the UDI curriculum must

reflect an “awareness of the unique nature of each learner and the need to address differences” by offering the following (Burgstahler, 2015:pg. 2):

- a) **Class Climate**- Priority should be given to both diversity and inclusiveness;
- b) **Interaction**- there should be regular and effective interactions between students and lecturers using accessible communicating methods;
- c) **Physical Environments and Products**- All learning materials and activities must reflect a class climate that values both diversity and inclusiveness;
- d) **Delivery methods**- instructional methods should be accessible and content should be delivered via multiple modes. All students should have a choice with regard to options for learning, with a focus on encouraging engagement;
- e) **Information resources and technology**- All course content, notes, and other study resources must be accessible to all students;
- f) **Feedback**- Provide feedback to students regularly to ensure sufficient interaction prior to the due date of projects;
- g) **Assessment**- There should be a variety of assessment methods, equipment and adapted instructions to suite SWVDs’ individual needs; and
- h) **Accommodation**- Plan for the accommodation of students with visual disabilities whose instructional design will include enlarged fonts or Braille. Braille is referred to as a system of touch reading and writing for blind people where raised dots on paper represent the letters of the alphabet.



Figure 2. 1: Braille- Illustration from Dutta (2013)

Guided by the above, this study aims to put into practice the principles for the universal design of products and environments specified in "The Center for Universal Design - Universal Design Principles" (1997) listed in Table 1.

Principles for the universal design	
Principles	Application
1. Equitable use	The design must be usable to SWVDs.
2. Flexibility in use	The design should accommodate a wide range of individual preferences and abilities.
3. Simple and intuitive use	The design must be user friendly regardless of the user's experience, knowledge or language skills.
4. Perceptible information	The design communicates necessary information effectively to the user, regardless of abilities.
5. Tolerance for error	The design caters for and minimises the adverse consequences of accidental or unintended actions.
6. Low physical effort	The design can be used efficiently and comfortably and without strain.
7. Size and space for approach and use	The design must allow use regardless of the person's body size, posture, or mobility.

Table 2.1: The Principles for Universal Design(The Center for Universal Design - Universal Design Principles, 2022)

2.3 Universal Design of Instruction (UDI)

Several research studies have indicated that many barriers are faced by students with visual disabilities in HE, and advocate that HEIs review their models of support (Dutta 2013; Hewett, Douglas, McLinden & Keil, 2018; Burgstahler, 2017). This study focuses on the re-design of existing services, exploring the need to create a new design in planning and keeping the diverse needs of SWVDs at the forefront. Higher Education Institutions face challenges to find a balance

between adapting learning environments to be inclusive to accommodate all students and distinguishing where it is necessary to make specialised adjustments for SWVDs whilst working in collaboration with the learner (Hewett et al., 2018). Burgstahler (2017: pg.1) highlighted the importance of being guided by a series of steps in exploring the possibility of implementing UDI at UKZN.

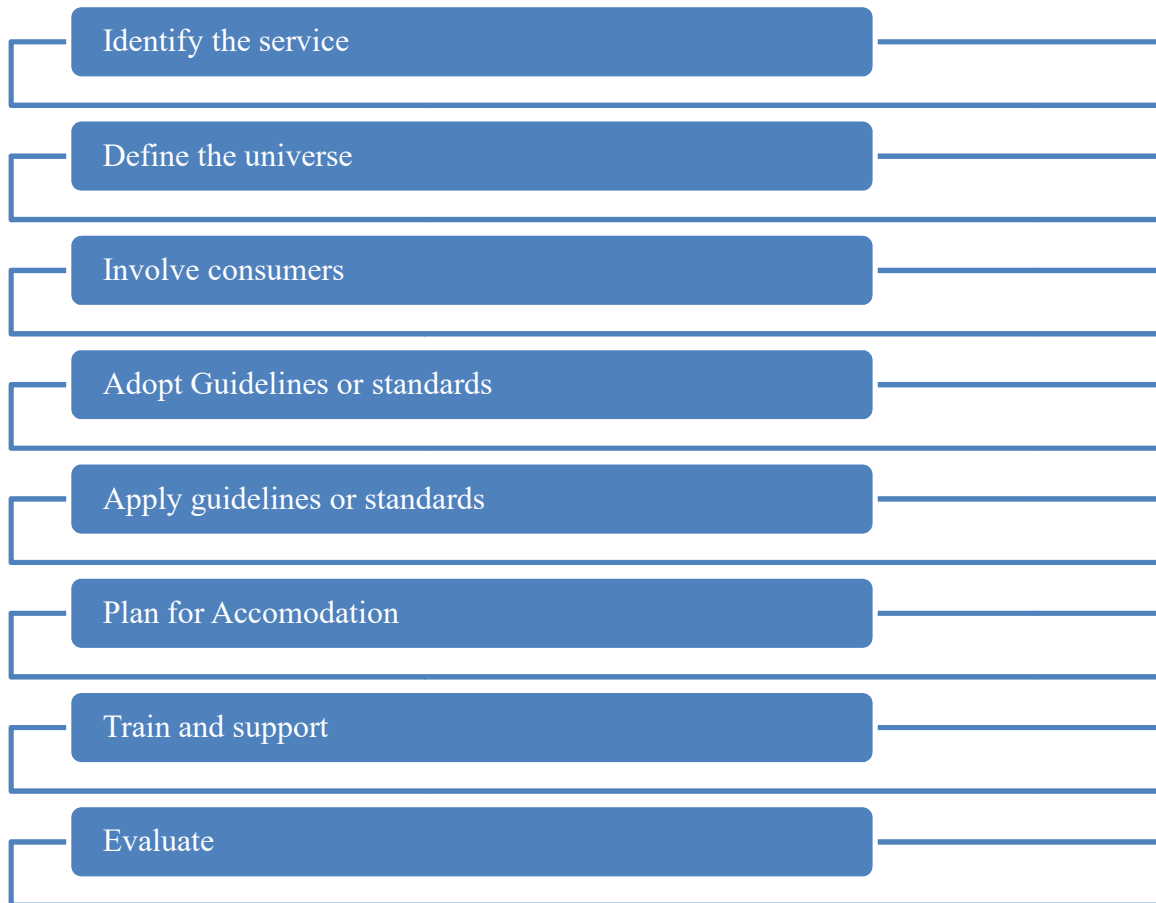


Figure 2. 2: Steps in the Implementation of UDI (Burgstahler, 2017)

The university requires a reasonable approach to planning for the implementation of UDI. Jolley, Lynch, Virendrakumar, Rowec and Schmidt (2017) placed renewed emphasis on inclusion as an achievement. Thus, inclusive practice by assessing the current situation of SWVDs at UKZN and the effectiveness of various approaches to support inclusion is a valid starting point in creating an inclusive university environment. In addition, the effectiveness of UKZN's current disability

programs needs rigorous evaluation against an international model for inclusive education (Jolley et al., 2017). Hence, it becomes necessary to explore the implementation of UDI as a new model to prompt inclusive education at a local university such as UKZN. Dalton, Lyner-Cleophas, Ferguson and McKenzie (2019) confirmed that tools for inclusive education do exist and can lead to success, if applied creatively and effectively. For instance, UDI exists and can provide means to achieving comprehensive inclusion in HEIs for students with diverse needs such as SWVDs.

Burgstahler (2018) stressed that universities need to be assessed to determine whether they require re-designing of existing services or creating new ones. Furthermore, Burgstahler (2018) suggests that tackling the issue of the implementation of UDI required deliberate small steps towards this goal to ensure that it is attainable. In line with this study's intention Ferreira and Sefotho (2020: pg102) agreed that focus should be placed on "what is already present and available and what is already being done". It is equally important that all stakeholders challenge attitudes and perceptions and remain cognisant that the benefits of an inclusive society far outweigh the losses.

This study adheres to several aspects suggested in Burgstahler (2018) about the current position/state of the university to achieve such an outcome. This includes:

- What impacts the range and delivery of instructional services provided?
- Defining the universe with the diverse characteristics requiring the use of services. In this study, the selected population is all SWVDs.
- Involving and considering perspectives of all SWVDs in all phases of the development, implementation, and evaluation of the instructional service.
- Reviewing current policies and best practices to identify specific strategies for delivery.
- Identifying existing universal design guidelines and standards for the service.
- Finding ways to integrate universal design practices if possible.

Pandey (2018) asserts that SWVDs are those whose vision loss indicates that they need to be trained to use Braille, tactile and other auditory materials. There is a multitude of methods to incorporate UDI in HEIs to assist SWVDs and facilitate teaching and assessment. In so doing education in the present day can be used as a powerful force in bringing about development changes in society (Social model) (Pandey, 2018).

It was revealed by Dalton et al.(2019) that there is emerging research-based evidence that proves UDI can positively influence the level and experience of learning for the diversity of students at various levels of education. The Universal Design of Instruction is therefore, appropriate in providing access to education for such diverse learners in HEIs. Ngubane-Mokiwa (2016) asserts that UDI simplifies the classroom experience by designing environments, products and services usable by everyone. Burgstahler (2018) supported this as it aligns with UDI principle two, which relates to flexibility in use, and UDI principle four on perceptible information, where the design should benefit all people of all ages and abilities.

The main objective of applying UDI is to promote access, participation and progress in the pedagogy for all learners, including SWVDs (Ngubane-Mokiwa, 2016).

2.4 A Comparative Overview of UDI in Developed and Developing Countries

Munene's (2017) statistics indicated that 10%, or roughly 650 million, people worldwide live with a disability. Furthermore, Persons with disabilities (PWDs) experience exclusion from necessities, including education, employment and healthcare amongst various other things (Munene, 2017). The author believed that the external environment in which HE institutions operated was continuously changing. Universities should concern themselves with the goal of learning environments with greater accessibility for students with visual disabilities. Universal Design of Instruction can serve as a driving mechanism to uphold institutional values by contributing to combating challenges faced in maximising learning outcomes for students with visual disabilities. Several scientific research outcomes have suggested that progress has been achieved (De Montfort University, 2019; Munene, 2017; Bhattacharya, 2017). Inclusive education in high-income countries and many low and middle-income countries has adopted

accessibility policies, hence reaping the benefits. Since there is no specific process globally on how to introduce inclusive education, Schiemer (2017: pg.172) believes that it is highly “valuable to look at the deeper structures of other societies” to gain insight into how equity in education can be achieved when working towards inclusive education.

Pearson and Koppi (2002) declared that HEIs worldwide adopted flexible learning methods and online technologies that increased the potential for widening access to learning for SWVDs that may have been difficult or impossible previously.

In line with Madriaga et al. (2010), the development of accessible, flexible and informative coursework and teaching strategies will benefit SWVDs as well as provide a better educational experience for all students. This study embarks on an extensive global search in compliance with Schiemer (2017), who confirmed that transforming societies to become more inclusive was highly reliant on the UDI approach. Furthermore, to improve current perspectives on how to introduce inclusive education practices, this study focuses on the values of diverse societies and focuses attention on their logical co-existence with SWVDs.

The implementation of accessibility standards evolved in some countries through various disability systems (Munene, 2017). In studies such as De Montfort University (2019), Munene (2017) and Bhattacharya (2017), these types of disability systems appear to be beyond the reach of countries like South Africa because of their limited resources and inadequate enforcement and adherence to policy. Universities in developed countries and their progression with inclusivity and accessibility can inform how South African universities can ensure that they remain competitive on a global scale.

2.4.1 UDI in Developed Countries

2.4.1.1 De Montfort University- United Kingdom (UK)

Given that there are more than 800 different research studies on the principles of UDI and decades of research about how people learn, Universal Design of Instruction and its application should become mandatory (De Montfort University, 2019). Embedding inclusivity and choice for both lecturers and students, UDI was expressed as:

"a crucial step towards meaningful inclusion in the sphere of education of students with disabilities" (De Montfort University, 2019).

Universal Design of Instruction and its benefits for DMU staff and students were presented as a framework to discuss the necessity of its applicability in universities based on the following three key principles of UDI (De Montfort University, 2019):

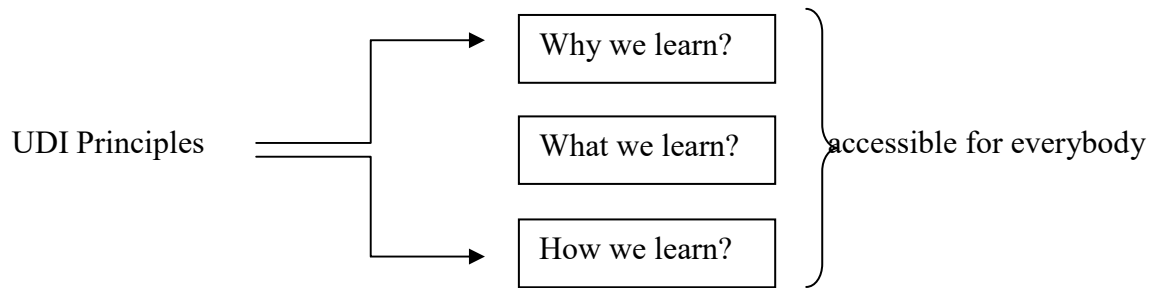


Figure 2. 3: Three core Principles of Universal Design of Instruction(De Montfort University, 2019)

I. Flexible ways of learning (Why?)

It is all about inciting interest and motivation, giving SWVDs the desire and tools to engage with their learning and become passionate learners. As a result, SWVDs become more engaged.

Examples include:

- Teaching sessions that encourage participation in innovative ways, and
- The use of creative and imaginative teaching aids.

II. Flexible study resources (What)

This refers to the content given to all students which they will grasp in different ways. As a result, a wide variety of content must be taught in different ways. The outcome of this strategy will create avenues to develop skills that one may not necessarily acquire from written work or essays. Take for instance when SWVDs get involved with presentations, social skills are enhanced. The following are examples:

- Ensuring that font dimensions of study materials can be modified to preference, and
- Availability of lectures in audio format to access before or after lectures for revision and assessment support

III. Flexible ways of testing learning (How?)

This involves providing a choice for SWVDs instead of offering something fixed and restrictive. Providing knowledge in flexible ways allows everyone to choose a different selection, ultimately satisfying all and providing an enjoyable learning experience. De Montford University utilised "REPLAY" software that allows SWVDs to access the audio-visual content of lectures. Universal Design of Instruction is simple to incorporate, whereby consideration is given to the different ways in which students learn (DMU, 2019).

Examples include:

- Providing alternate methods of assessment to challenge students with visual disabilities in different ways, and
- Offering a range of ways to demonstrate learning and understanding of subject material. For instance, using screen reading software and audio-visual aids.

Munene (2017) emphasised that Universal Design of Instruction was neither a new science nor a unique style. He explained that universal design implied creating awareness of a common-sense approach to teaching and learning. This study noted that products and services can be designed such that it does not require further adaptation or specialised design. Burgstahler (2018) and Munene (2017) agreed that such an approach considered the needs of all learners, eliminating unnecessary barriers to teaching and learning whilst maintaining academic rigour. Munene (2017) described this as a design for the diverse that integrated accessibility and social inclusion issues.

2.4.1.2 The United States

In the United States, the Centre on Post-secondary Education and Disability (CPED) promoted access to post-secondary education for students with visual disabilities and examined the application of UDI and its principles (University of Connecticut [UConn], (2019). This approach led to the development of instructional models and online tools that favour the implementation of UDI. Although there was limited evidence related to effective teaching practices for diverse learners, the need for inclusive teaching courses in higher education institutions has been growing prominently across the United States (Madaus, 2019). In light of increasing number of institutions offering online courses and with more students enrolling in these courses, the need for universal, innovative, instructional practices accelerated the need for more course designers at the University of Connecticut to introduce the UDI principles to provide curriculum planning, methods of delivery and various assessment procedures (Madaus, 2019). It follows that South Africa can prepare and forecast the possible predicament they may encounter following the implementation of UDI.

2.4.1.3 Kentucky

The University of Kentucky (UK) explained that universal design originated from the field of architecture in the early 1980s and expressed the concept in terms of:

"aesthetic & usable to the greatest extent possible by everyone, regardless of age, ability, or status in life."

Similar to De Montfort University, the University of Kentucky believes that Universal **Design of Instruction** (UDI) is essential. In exploring using new technologies to provide better educational experiences to students, the UK applies this evolving framework based on the three networks of the learning brain, namely:

- Affective- why we learn
- Recognition- what we learn
- Strategic- how we learn

Aimed to:

- Stimulate interest and motivate SWVDs for learning;
- Deliver content and information in different ways; and
- Differentiate the ways SWVDs express what they know/learned (University of Kentucky|Universal Design for Learning, 2019).

To incorporate UDI, the UK pointed out that it used curriculum developers, faculty, staff and institutions in commissioning curricula and learning environments to make learning accessible to highly diverse learners. Digital technology in the theory and practice of UDI is essential to enable customisation, alternate representations and true interactivity (University of Kentucky|Universal Design for Learning, 2019). Therefore, South African universities need to be aware that using adapted digital technology requires addressing learning networks from the outset (University of Kentucky|Universal Design for Learning, 2019).

Similar to the University of Kentucky, by simply applying teaching strategies in more flexible ways, providing students with options for engaging with the course content and providing ways to access course materials, UKZN and other South African universities can incorporate UDI into their mode of **instruction** (University of Kentucky| Universal Design for Learning, 2019). The incorporation of UDI can range from being simple, inexpensive, easy to implement to somewhat complex and time-consuming or even costly. Dalton et al. (2019) claimed that designing for the inclusion of all students including SWVDs is cost-effective in the long run. And in comparison to race and language it engaged a greater diversity of students. According to the University of Kentucky|Universal Design for Learning (2019), it all depends on the different subject matter and different teaching styles and philosophies that may work better with specific strategies when designing and developing a new course (University of Kentucky|Universal Design for Learning, 2019). The University of Kentucky suggests multiple strategies to implement UDI.

Developing countries have the lowest socio-economic development and Human Development Index ratings (World Population review, 2019). These countries have weaknesses in areas such as nutrition, education and literacy; have economic vulnerabilities; and have widespread poverty. Although developing countries have the majority of neglected persons with disabilities, there is little attention given to the significance of implementing a Universal Design system

(Munene,2017). Munene (2017) concurred with Muyembe (2009) in providing insight into the cost-effectiveness of UDI implementation. It was conveyed that implementing UDI in Least developed countries (LDCs) had various factors ranging from negative attitudes to the lack of proper infrastructure, and equipment deemed too expensive. However, Munene (2017) revealed that involving local stakeholders had a two-fold benefit that was critical for the cost-effectiveness of UDI implementation. Firstly, it helped identify locally available products and construction techniques. Secondly, it ensured regular maintenance of these facilities by the local community. Munene (2017) argued that without these systems in place, the cost of having this kind of assistance would be more expensive.

2.4.2 Universal Design of Instruction in Developing Countries

2.4.2.1 Japan

Japan adopted the perspective of fairness, which meant "not discriminating between users, freedom of choice that permits flexible satisfaction of individual needs, and participation that encouraged planning with the involvement of persons with disabilities" (General Principles of Universal Design Policy, 2005: pg.6). Japan understands that for PWDs to express their individuality and capabilities required them to be fully part of that society and in this way gain self-actualisation.

Japan recommended that it was essential to institute a plan of action that was “staged and continued to achieve a universal social environment” (General Principles of Universal Design Policy, 2005: pg.7). The researcher adheres to this recommendation by suggesting that proper planning before the implementation of UDI should form part of UKZN's long-term goals.

To further promote universal design practices at the university level, the researcher verifies its advantages and disadvantages from a critical standpoint based on a case study between Japan and the United States by Saito (2006).

Countries	Advantages of applying the principles of Universal Design	Disadvantages
United States	<p>Organisations will increase their number of users.</p> <p>Benefits will include, improved corporate reputation, customer satisfaction and reduced maintenance costs.</p> <p>Applying UDI increased productivity, users were satisfied and it reduced legal risks and compensation obligations.</p> <p>Recognised more advantages of UDI and expected improved accessibility motivated in the future.</p> <p>The US is less concerned about cost issues and land prices than Japanese peers.</p> <p>Initial construction costs will be higher however applying UD will lower running costs.</p>	<p>Rather than understanding the benefits of applying a universal design and its effectiveness for their own organizations U.S. organizations adopt universal design principles mainly because they were obligated by laws.</p> <p>Construction costs, reduced efficiency and increased use of space will result from UDI. Greatly demotivated by inefficient area usage.</p> <p>Hindered by cost implications and lack of experienced executives.</p>
Japan	<p>Japanese expected that UDI practice will increase the number of persons with disabilities in the future.</p> <p>Enhanced corporate image and/or reputation</p> <p>More flexibility in employing diverse users and users will be more satisfaction and productive.</p>	<p>Applying UDI resulted in unfavourable cost issues.</p> <p>Expected an increase in the cost of production and inefficiency space usage.</p>

Table 2.2: A Comparative Study of the Advantages and Disadvantages of Applying Universal Design in Japan and US (Saito, 2006).

The study proves that the application of universal design will not have any negative implications for the institution. Rather, a positive perception of its advantages led to action (Saito, 2006). Recognition of one huge benefit could motivate institutions of learning to improve the level of

applying UDI, for instance, regarding cost implications. Due to its many advantages, UDI can be used as a trigger to advance the level of practice. The study emphasised that the application of UDI highlighted the diversity aspect of successful institutions and can therefore be used as a corporate strategy that could enable South African universities to survive intensive business competition (Saito, 2006). The study revealed solutions to cost-related issues by applying the Universal Design of Instruction through various efforts. This included financial incentives, political interventions or understanding negative perceptions (Saito, 2006).

2.4.2.2 India

Universities in Delhi in India have seen academic reforms as a necessary condition for improvements in the quality of education. Such reforms included initiating UDI practices in teaching and learning and enhancing training for in-practice teachers at universities. Research by Bhattacharya (2017) showed that adopting UDI principles in HE would reach a broader range of students and provide a more positive student perception of the learning material presented. Bhattacharya (2017) focused on two criteria to implement change, namely:

I. Innovations in Teaching

- Learning Methods

II. Teachers to continuously upgrade qualifications and knowledge (Bhattacharya, 2017).

Bhattacharya (2017) pointed out that the newer generation of SWVDs possessed greater digital literacy that increased the use of technology in HE. Evidently, it is essential to incorporate UDI and teaching approaches that include digital tools and resources to engage the SWVDs of today. The fundamental objective of India's Higher Education and Research Bill (HERB, 2011) was to enhance access and inclusion in higher education. The Bill highlighted that its objective could only be achieved through the meaningful participation of SWVDs in higher education.

In line with these objectives outlined in HERB (2011), integrating UDI as a practice in legislation and teacher training programs was seen as a revolutionary approach to bring about change in teaching and learning in HE in India (Bhattacharya, 2017).

2.4.2.3 Kenya

Other developing countries have taken strides towards a more inclusive education system through the Universal Design of Instruction. South African universities can follow suit and imitate other countries by incorporating a widely researched system like UDI. For instance, Kenya has made progress in several areas towards inclusive education when they piloted the prototype of an accessible digital textbook that follows the principles of UDI (Baheta & Rabenstein, 2018).

Kenya realised that innovation needs to start as early as possible (Baheta & Rabenstein, 2018). In response to this, the Government of Kenya distributed almost one million tablets to primary schools across the country to increase digital literacy and learning outcomes (Baheta & Rabenstein, 2018). Furthermore, the Government endeavoured to reform outdated modes of instruction in schools with a new competency-based curriculum (Baheta & Rabenstein, 2018).

Baheta and Rabenstein (2018) demonstrated that it was essential to foster favourable environments, available digital devices in schools and political goodwill to reform the education system. This laid the foundations for innovation to increase digital literacy and learning outcomes. The Government of Kenya supported the development of accessible digital learning materials for children with disabilities and UNICEF Innovation Fund assessed the global situation and provided the necessary technical support with funding, which enabled Kenya to become the first country worldwide to pilot the accessible digital textbook (Baheta & Rabenstein, 2018).

2.4.2.4 South Africa

Ferreira and Sefotho (2020) identified Visual impairment in South Africa to be a leading barrier to learning, with serious socioeconomic consequences for learners and the society at large.

Therefore, Ferreira and Sefotho (2020) suggested that due to the complexity of visual impairment educators are required to acquire relevant visual impairment teaching competencies.

The University of Cape Town hosted a workshop in 2011 which was the first attempt to introduce UDI in South Africa to evaluate its potential usefulness (Dalton, Mckenzie and

Kahonde, 2012). Despite the various inclusive education policies described above, incorporating a Universal design system in “South Africa is slow and only partial” (Dalton et al., 2012: pg. 2). The incorporation of UDI was fraught with the lack of teacher skills and knowledge to provide a modified curriculum to attend to learning needs (Dalton et al., 2012). It was evident from the study that there is potential for this approach to expand through further teacher training.

Dalton et al. (2012) pointed out that lecturers and all stakeholders can work collaboratively to benefit their learners by aligning with the principles of Systems Theory (Becvar & Becvar, 2014). The workshop led to the discovery of numerous methods for presenting lecture content, ways to express knowledge and ways to engage with the learner. The workshop revealed that UDI was not a high-technology option and can be undertaken at various levels of the institution. Alternately, low-tech options achieved similar outcomes when implemented by using the three core UDI principles mentioned in Figure 2.3 above.

The study found UDI to be relevant and applicable to the South African context. However, much support was required from the Department of Education and “ongoing training and professional development of all professionals involved in the system of education” (Dalton et al., 2012: pg. 6). The workshop found ways to implement UDI with and without technology. It also encouraged the use of an instructor checklist tool that helped with the planning for UDI implementation. It revealed the simplicity of the method and suggested that such workshops continue to promote UDI implementation in South Africa (Dalton et al., 2012). The study recommended that UDI be put into practice as it will increase proficiency and assurance in UDI implementation. However, the workshop was held over only one day, emphasising the need for more studies of this nature in South Africa.

There is an abundance of research on UDI in Higher Education in developed countries and other developing countries worldwide that raise questions about UDI and its implementation in classrooms of HEIs in the USA and globally (Dalton et al., 2012). Based on such studies, it raises the general question of why there is such a scarcity of universal design systems in HEIs within a South African context. The Stellenbosch University Disability Access Policy (2018) aligns with its Strategic Plan and promotes an inclusive, innovative and future-focused environment for people with disabilities. Furthermore, the University of The Free State

(UFS) and University of Cape Town (UCT) have implemented UDI workshops and awareness sessions (Dalton et al., 2012). However, based on various internet searches via the academic search engines explored above, strategies that incorporate UDI in Higher Education in South Africa have not been adequately researched, nor are there similar studies of this nature within the continent of Africa. As a result, it is apparent that conducting a study that fulfils the listed objectives and answers the research questions would contribute to closing the gap in the lack of UDI research in African HEIs. In addition, it will add value to the research area and be the first of its kind to examine UDI as a proposed model for SWVDs at a South African University. Africa is a developing continent and it is imperative to identify the need to employ strategies that incorporate UDI in Higher Education placing the country at a competitive advantage in the global sphere.

2.5 The Complexities Relating to UDI and its Implementation across Higher Education Curricula

According to Heylighen (2014), the concept of Universal Design of Instruction (UDI) was not widely accepted and was received with scepticism. The term ‘universal design’ was introduced by Ronald Mace, who defined UD as an attitude as well as an approach to design a system to be "usable by everyone to the greatest extent possible" (Heylighen, 2014, pg. 2). While UDI implementation has good intentions and an attitude associated with accessibility and functionality, it is also considered utopian, meaning that it was not possible to design for everyone. Godden and Hsy (2015) argued that UDI is a myth and sees it as a temporary deferral of an inevitable human condition. It was believed that if humans lived long enough, disability will ultimately affect everyone. Furthermore, by incorporating Universal Design of Instruction, languages beyond the understanding of other individuals made UDI partially accessible to users unfamiliar with the UDI language used in its implementation (for instance, sign language) (Godden and Hsy, 2015). A universal design that caters for sign language does not address the challenges of users who are unfamiliar with sign language.

Makoelle (2020) pointed out that implementing inclusive education globally for SWVDs is a human right. However, language and terminology are key elements in the context of

transforming education toward an inclusive education system. Within the emerging discourse of inclusive education, Makoelle (2020) highlighted how changing language and terminology was necessary to embrace transformations. The implementation of inclusive education focuses on changing pedagogical methods, curriculum delivery, HE infrastructure and communication. Although there has been success in many avenues that underpin inclusive education, the language used in terms of inclusive education has not changed. Consequently, past vocabulary continues to perpetuate misconceptions and stereotypes about diversity and difference.

Godden and Hsy (2015) argued that universal design is a process; a means rather than an end; and that there is no such thing as a universally designed text. However, there is inconsistency with this argument. Therefore, the inclusive focus of the current study is to aspire toward a universal design system of inclusiveness within the classroom, considering Universal Design of Instruction will result in unforeseen problems. However, designers should keep in mind that successful implementation will include all users "to the greatest extent possible" (Heylighen, 2014: pg.2). There will usually be somebody whose perspective will not be taken into consideration. There will always be a person whose perception will differ and not be taken into account. Therefore, the study sees UDI as a goal towards which to strive. Furthermore, Godden and Hsy (2015) emphasised UDI to be a process or emergent technology rather than a product.

Heylighen (2014) suggested that when considering UDI for implementation, one should choose an approach that is most appropriate within a given context. Universal design of Instruction requires the empathy and involvement of designers and users. There must be a balance between the designer, what they intend to design and the user experience (Heylighen, 2014). This is consistent with the nature of design where the person who adapts a space is usually someone other than the one who will use it. Therefore, relevant experiences in understanding what they design place great emphasis on who designs the space. In most cases, designers have not personally experienced having a visual disability or being blind, which can have significant implications for its application. Heylighen (2014) emphasised the importance of measuring performance by using a process known as Post Occupancy Evaluation (POE). This process is an actual evaluation of performance once in use by, for instance, measuring the performance of SWVDs after UDI is successfully implemented. Such an evaluation has significance in addressing possible problems with its implementation through feedback from the users.

Applying the UDI principles promoted learner independence, autonomy and individualism (Heylighen, 2014). This usually originates from a design that is accessible, with reliable resources and environments conducive to learning resulting in freedom of choice and enhanced autonomy of the individual (Heylighen, 2014). Therefore, Hewett et al. (2018) suggested that it was necessary to evaluate the experiences of SWVDs in the HEI context to assess their role as independent learners. Learner independence, autonomy and individuality are key factors associated with UDI stemming from the United States civil rights movement of the late 1960s. The Disability Rights Movement highlighted that by being “given appropriate services, accessible environments and pertinent information and skills, blind individuals may actively participate in all aspects of society” (Heylighen, 2014: pg.3). Heylighen (2014) claimed that a person's independence did not only focus on doing things on their own. Rather, it emphasized recognising and encouraging a more beneficial interaction by using a Universal Design system.

Godden and Hsy (2015) stressed that UD is an unachievable goal that is problematic and ultimately inadequate for the continuously evolving nature of the disability. However, Heylighen (2014) pointed out that independence, self-reliance and individualism, which characterised UDI, needed consideration when designing inclusive environments. Designers should consider such principles as a valuable alternative to inclusive environmental design. Godden and Hsy (2015) argued against implementing UDI as lecturers expressed that due to time constraints they could not generate and execute program changes or had other programs or workload problems.

The principles of universal design were formulated by the Centre for Universal Design at North Carolina State University (Heylighen, 2014). These principles were the criteria that defined what maximised its usability. However, all criteria are not entirely necessary for good design. It can be open to other factors that may impact its implementation, like cost, safety, gender and cultural appropriateness (Heylighen, 2014).

Assistive technology and UDI have enormous benefits that provide barrier-free access so that SWVDs can function more independently with less reliance on other people. However, Godden and Hsy (2015) claimed that existing technology can be inadequate, implying that it can break down, be unreliable or maybe a poor substitute for human help.

Godden and Hsy (2015) concurred with Heylighen (2014) in that UDI encourages reciprocity between user and designer where it was necessary to work with SWVDs to meet their needs. This will in turn benefit designers significantly to devise how digital devices could and should work with and for SWVDs. Godden and Hsy (2015) and Heylighen (2014) correlate the view that UDI principles need to accompany and not supplement the instructional design and learning styles of the individual who requires it. Reciprocity, based on the principles of Systems Theory, implies that there should be mutually beneficial solutions that do not overpower those without disability (Godden and Hsy, 2015).

2.6 A Legislative Context

a) Inclusive Education and Individuals with Visual Impairment

The evolution of democracy and socialism in other countries gave rise to education being considered the basic right of the child (Rajkonwar, Dutta and Soni, 2015). This emphasised the fundamental role that HEIs play in bringing about inclusivity to enhance the experiences of students with visual disabilities (Rajkonwar et al., 2015). Rahman (2019) explained that inclusive education is internationally recognized as a philosophy for attaining equality, justice and quality education for all students, especially for SWVDs previously excluded from mainstream education. Therefore, it is expected that inclusive education improves the education system by limiting or removing barriers to learning while acknowledging students' individual needs and potential (Rahman, 2019)

Inclusive education is an essential part of learning programs as it enables all learners with or without disabilities to participate holistically within a mainstream setting (Systems Theory). It provides learners with equal opportunity to jointly undertake learning without discrimination and also promotes a sense of belonging within that mainstreamed setting (Maslow 1943/54). Practicing inclusive education at a university is part of the universal right to education which extends to all children, youth and adults with visual impairment, supported in declarations like **Education for All (1990)**, Standard Rules on the **Equalization of Opportunities for Persons**

with Disabilities | United Nations, (1993) and the **Salamanca Framework for Action (1994)**. Furthermore, inclusive education places the SWVDs in the regular classroom (**Rahman, 2019**). As such, this study focuses on equipping the university to satisfy the fundamental right to education for SWVDs by employing the principles of UDI in the classroom.

The **World Health Organization (WHO)** estimated that 15% of the global population, which amounts to approximately one billion people are living with a disability (World Health Organization (WHO, 2011). Females, the elderly and people in low-income areas are unreasonably affected by disability due to poor health and restricted access to services. The Sustainable Development Goals and the "Leave no one behind agenda" established a global drive to ensure that destitute groups such as SWVDs are incorporated in mainstream development initiatives (Jolley et al., 2017: pg. 2704). In an attempt to join and contribute to this global drive, the University of KwaZulu-Natal aligned its 2020 Disability Online Research and Practice Indaba with an agenda themed: "No student will be left behind: Reimagining Higher Education Disability Services in Response to Covid-19". The awareness campaign was hosted in November 2020 by the Disability Support Unit (DSU) of the University of KwaZulu-Natal (UKZN), a knowledge generator that contributes to strengthening disability scholarship and practice from diverse perspectives and contexts. An in-depth discussion of the 2020 Disability Online Research and Practice Indaba ensues later.

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) is a worldwide treaty that supports the rights and freedom of people with disabilities in society (Jolley et al., 2017). Technology should promote inclusivity by taking into account the accessibility and usability features to protect the human rights of SWVDs (Ngubane-Mokiwa, 2016). Therefore, to draft the national disability policy, South Africa conferred with progressive legislation in line with the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), articles 24 (education) and 27 (work and employment) (Subbiah, 2020). South African policies encourage more enabling, inclusive and accessible tertiary education to improve the quality of the holistic support services for SWVDs to produce productive graduates (Systems Theory). However, the responsibility to ensure inclusivity relies on all 166 countries that signed the UNCRPD to ensure that PWDs can access general education, tertiary education and other forms of education without discrimination and on an equal basis with others (Ngubane-Mokiwa, 2016).

There is a consensus amongst various authors that despite the clear stipulation of UNCRPD and other disability rights policies, the emergence of COVID-19 exposed the disconnect between policy and the implementation of appropriate strategies (Subbiah, 2020; Jolley et al., 2017; Singh, 2017; Ngubane-Mokiwa, 2016 and Kasiram & Subrayen, 2013). Subbiah (2020) claimed that policy implementation was found to be varied and continues to remain a challenge in many settings. Kasiram and Subrayen (2013) motivated that policies, legislature and mission statements about SWVDs be implemented and practiced. However, students with visual disabilities remain dis-enfranchised from access to quality education due to the persistent mismatch between policy and procedure. Singh (2017) agreed that although the legislature leaned towards the enabling of inclusivity and access to HE, it does not directly transform the lives of SWVDs. Dalton et al. (2019) maintained that despite policies that reflect the desire and need for inclusive education in SA the reality of its implementation make it an elusive goal. Therefore, effective inclusion in higher education for SWDs has been inconsistent. Ferreira and Sefotho, (2020) concurred that even though something is possible and that may be advocated in policy did not ensure it will be enacted in practice. However, Ferreira and Sefotho (2020: pg 145) advised that collaborative efforts can facilitate positive change by expressing the words of Francis of Assisi: “Start by doing what’s necessary; then do what’s possible; and suddenly you are doing the impossible”.

Kasiram and Subrayen (2013) drew attention to another perspective concerning university policy. The UKZN policy on staff and students with disabilities emphasises accepting students with disabilities. Since there is no strict adherence to policy, Kasiram and Subrayen (2013) believe that it meant greater prejudice than just excluding such students at university. Furthermore, making a commitment to fulfil the academic learning needs of students with disabilities and not following through proved to be more damaging as it disheartened SWVDs and their families, and burdened them financially (Kasiram & Subrayen, 2013).

Disability and poverty are strongly related in low-income areas such as in South Africa (Jolley et al., 2017). Profoundly, the availability of limited resources as well as the lack of knowledge on disability restricted the government’s ability to invest in inclusive education for SWVDs that increasingly adds to their marginalisation and vulnerability (Jolley et al., 2017).

Dr Nelson Mandela emphasised that education was fundamental in dealing with poverty and advancing the nation, which is encouraging for poverty-stricken and marginalised populations in South Africa. It is the charitable organisations that have assisted in meeting the needs of the poor and marginalised on a small scale. However, such charitable endeavours, although beneficial, tend to encourage separate provisions reinforcing discrimination and prohibiting government involvement in providing accessible services to all citizens (Jolley et al., 2017). By engaging the Social Model and exploring the social constructions of disability, it becomes apparent that society in trying to assist the marginalised has segregated them instead. As such students with visual disabilities have not benefited from general policy as policy formation and policy implementation remain a challenge due to government resource limitations (Jolley et al., 2017).

It was conveyed by Jolley et al. (2017) that SWDs in Sierra Leone were hopeful that they will receive assistance from the government and various national and international organisations. This study therefore focuses on exploring the implementation of a model such as UDI to address critical points of inclusion guided by its seven principles. Jolley et al. (2017) advocated in a study that included other African countries that disability should be on the sustainable development agenda. However, achieving this requires the inclusion of disability matters in general policies and the political sphere (Jolley et al., 2017). More specifically, Jolley et al. (2017) asserted that Poverty Reduction Strategies be explored in conjunction with the United Nations Convention on the Rights of Persons with Disabilities and focus on strategies to influence policy that promotes the inclusion of SWVDs.

The current study explores consolidated efforts applied nationally and internationally to understand the implementation of UDI that informs ways to reduce existing gaps in the implementation of policies that are specific to South Africa (Jolley et al., 2017). The implementation of UDI at a South African University can be achieved by establishing effective methods for coordination and sharing information between various stakeholders at that university (Systems Theory). This pertains particularly to stakeholders that participate in disability advocacy and programs such as the Humanities Access Program and the Disability Services Unit (DSU). This study encourages interest in the field of Disability research and narratives which are lacking in exploring the university experience through the "eyes" of SWVDs at a mainstream University. What is known about the experiences of SWVDs is largely based upon empirical

studies such as those by Jolley et al. (2017) and Kasiram and Subrayen (2013) that attention to the importance of documenting, analysing and reporting learning experiences. Research is needed to gain experience on methods and strategies to achieve inclusive education. As such, Dalton et al. (2019) insisted that South African professionals engage with others in the field to learn different models such as UDI to implement inclusion at all levels of education. Accordingly, it will motivate and influence the efficacy of practicing inclusivity within a mainstream university setting such as UKZN.

The Constitution of the Republic of South Africa Act 108 of 1996 ensures equal opportunities in education for all learners, despite differences, without discriminating on the grounds of disability. Ngcobo (2006: pg. 4) deemed the Constitution of the Republic of South Africa (1996) to be “the most progressive constitution in the world”, protecting the rights of all citizens. This study is guided by education legislation and policies founded on the Constitution, which includes providing all learners with a high-quality education. It comprises the Bill of Rights and these laws are based on developing educational inclusivity and training schemes that guarantee equal access, full participation, overall protection and the promotion of fundamental human rights (Constitution of the Republic of South Africa, 1996). Ngcobo (2006) confirmed that the core focus of the Constitution is on diversity and providing high-quality education for all learners within diverse educational institutions (Ngcobo, 2006).

The study complies with Chapter 2, section 29 (1) of **The Constitution of South Africa 1996** which states that:

"Everyone has the right to a basic education and to further education, which the state, through reasonable measures, must make progressively available and accessible."

More specifically, the study complies with section 29 (2) of The Constitution of South Africa 1996:

"To ensure the effective access to, and implementation of, this right, the state must consider all reasonable educational alternatives, including single medium institutions, taking into account equity, practicability, and the need to redress the results of past racially discriminatory laws and practices."

Although clear mandates have been instituted in International, National and Local Declarations to facilitate the inclusion of SWVDs into the mainstream environment, full inclusion and participation are still lacking (Subrayen, 2011). Undeniably, the struggle against human rights violations and the oppression of persons with visual impairments is considered the greatest challenge of modern life in many nations (Subrayen, 2011). This reinforces the belief that despite an array of anti-oppressive instruments, the social exclusion and marginalization of oppressed minorities still exist. The study, in support of Subrayen (2011), understands that to counteract anti-oppressive practices and remove organizational, societal and attitudinal barriers requires paradigm shifts in disability thinking. As such, it becomes mandatory to explore universally accepted educational design systems such as UDI to facilitate the inclusion, emancipation and liberation of SWVDs into the mainstream of life.

The study addresses the issue stipulated in Article 26 (1) of the **United Nations Declaration of Human Rights [UNDHR]** that:

"Everyone has the right to education. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit."

The study also supports Article 26 (2) of the UNDHR in that:

"Education shall be directed to the full development of the human personality and the strengthening of respect for human rights and fundamental freedoms."

Although the Universal Design of Instruction (UDI) is a relatively new framework in Higher Education, it has generated significant support. This included studies by Izzo et al. (2008); Embry, Parker, McGuire and Scott (2005); and Rickerson and Deitz (2003) that applied UDI principles in occupational therapy education. Organisations such as the Association on Higher Education and Disability (AHEAD) have recognised the importance of UDI (Roberts et al., 2011). Furthermore, The Higher Education Opportunity Act of 2008 described it as a "scientifically valid framework for guiding educational practice" (Roberts et al., 2011: pg.7). Article 4, (f) of the United Nations Convention on the Rights of Persons with Disabilities (2006) supported this in the following statement:

"To undertake or promote research and development of universally designed goods, services, equipment and facilities, as defined in article 2 of the present Convention, which should require the minimum possible adaptation and the least cost to meet the specific needs of a person with disabilities, to promote their availability and use, and to promote universal design in the development of standards and guidelines"

It was stipulated in studies such as Singh (2017); Brandt (2011) and Harbour and Madaus (2011), that Universal Design of Instruction encourages inclusive pedagogy, curriculum design and learning environments fully adapted to accommodate the diversity of SWDs at university.

Madriaga, Hanson, Heaton, Kay, Newitt and Walker (2010) supported the view that emphasis should be placed on enhancing the SWVDs' learning experience and providing quality education for all as all students will benefit from an inclusive system such as UDI. This is consistent **with the Republic of South Africa, Department of Higher Education and Training [RSA, DHET](2013)** which stated that:

"The DHET will build its own internal capacity to support a new approach to addressing disability within post-school institutions, including information management, conducting research into disability in the post-school sector, policy development and support, and providing the necessary resources to institutions to enable transformation in this area."

Implementing UDI has implications that affect everybody within the university. Such research has generated an inquiry into the application of the Universal Design of Instruction (UDI) at a South African university (such as UKZN) to improve the inclusiveness of the instructional and learning environment.

The study explores a universal design system based on the Higher Education Opportunity Act (2008) and the United States Department of Education's National Education Technology Plan (2010) where it was emphasized that UDI was a framework that benefited all learners. Moreover, the study embraced the idea that universal design was a philosophy that included the widest possible range of SWVDs with functional capabilities that did not require assistive technologies.

This study understands that UDI is an instrument worth exploring to foster inclusion in higher education settings in South Africa. Several universities such as the University of Washington

(Burgstahler, 2018) and the University of Connecticut (Harbour & Madaus, 2011) have applied UDI by providing curriculum design and institutional environments that are fully adapted to accommodate the greatest diversity of students. In revisiting the current policy, UKZN could invest concerted interest in the implementation of UDI as part of the institution's long-term goals. As such, adherence to the set principles of the universal design approach could propel the university to the next level in the transformation towards greater epistemological accessibility to its diverse students with visual disabilities.

In 2019, there were approximately 709 SWDs at the University of KwaZulu-Natal, with 204 SWVDs (UKZN, Disability Support Unit, 2019). Historically, there has been a steady increase of SWDs every year. However, UKZN is not UDI-compliant in this regard. If there was UDI compliance and students with visual disabilities were given equal access to educational dissemination (e.g. Braille given by lecturers in classrooms and screen reading software on every computer in the schools), then there would be no need for the existence of a Disability Support Unit. Hence, there is a need to explore the potential of becoming compliant. This is likely due to a lack of knowledge of how to properly include these students through an understanding of how to provide appropriate accommodation/s, curriculum, class materials and choices in instruction that usually create barriers to education for SWVDs (Black et al., 2014). This may cause SWVDs to feel excluded resulting in inequitable epistemological access to education. The study motivates UDI to allow for flexibility in instruction, overcoming barriers and improving educational outcomes for SWVDs. Universal Design of Instruction would create a more inclusive environment for SWVDs. Such strategies include using various instructional methods in addition to traditional lectures and providing feedback, having clear expectations, following syllabi closely, and using a variety of assessment methods (Black et al., 2014).

Hewett et al. (2018: pg.2) alleged that although “legislation has a primary focus on the role of facilitating inclusive” education, an “unintended consequence of this focus” obscures the role of the learner in shaping their individual experiences. Furthermore, researched evidence on SWVDs in HE demonstrates the significance of the learner's contribution to his or her own experience (Hewett et al., 2018). This is in support of Maslow (1943/54), where curricula are designed and presented to obtain meaningful engagement in learning, creating a sense of **belonging** and

inclusivity (Hewett et al., 2018). This study agrees with Hewett et al. (2018) that it is imperative to evaluate the experiences of SWVDs in the context of their individuality.

Several studies argued that despite HEIs being legally obliged to include students with visual disabilities, it is evident that SWVDs continue to face barriers in HEIs (Dutta, 2013; Rahman, 2019; Hewett et al., 2018; Shaikh, 2017 and Kasiram & Subrayen, 2013). It was revealed by Kasiram and Subrayen (2013: pg.71) that discrimination “manifested as high levels of intolerance, disrespect and human rights violations”. Interestingly, this was mainly articulated by the society and HEIs which included university staff and able-bodied students.

Teachers' attitudes have not changed considerably. This study consulted several prior studies to understand how the negative attitudes of lecturers have attributed to the lack of reasonable accommodations for SWVDs (Gallego & Busch, 2015; Vickerman & Blundell, 2010 & Campbell et al., 2003):

- Teaching staff have displayed considerable anxiety, conferring accommodations as an unfair advantage on SWVDs and demonstrating that they have not properly consulted legislative requirements;
- Lecturers often do not have a clear understanding of the demands of SWVDs and do not fully understand their responsibility in this regard;
- Teaching staff display unpreparedness to implement changes to curricula and often lack adequate time for determining and implementing accommodations for SWVDs, which may require different strategies for each case;
- Variables and complexities related to accommodations for SWVDs found lecturers exhibiting significant levels of confusion and many lack confidence in their abilities to teach learners with diverse needs; and
- Lecturers' attitudes are influenced by past experiences of complexity related to disabilities requiring a case-by-case approach to teaching SWVDs.

Shaikh's (2017) findings correlated with this in that SWDs experienced prejudice and discrimination from some academic and support staff, which remain a barrier to student progress and development. In agreement, Storrie, Ahern and Tuckett (2010) established that academic staff do not know how to work with SWVDs and do not fully understand their needs. Ultimately SWVDs are expected to perform without adequate accommodations to meet their needs. Furthermore, staff members lacked specific skills in dealing with SWVDs, how to handle classroom behaviour, attendance and how students were going to handle the workload (Storrie et al., 2010). In addition, this lack of respect stripped SWVDs of their dignity when it concerned the different requirements of SWVDs regarding reasonable accommodation. As such, it was proclaimed by non-disabled students to imply that SWVDs were given an unfair advantage over other students. This promoted an "outsider status" or that SWVDs were unfairly given "special treatment" due to the nature of their disability (Kasiram & Subrayen, 2013: pg. 71). The exposition in the above argument creates an important awareness of existing problems that inhibit the epistemological access of SWVDs in the classroom.

Although the university may provide for the needs of SWVDs some experienced difficulties in learning the use of Braille and using assistive technology, which was attributed to the lack of trained staff and the non-availability of specialised or adapted equipment (Rahman, 2019). Kasiram and Subrayen (2013) suggested that problems relating to the extensive challenges that SWVDs face can be explored through their stories, suggesting that future research should adopt a narrative approach in order to understand classroom dynamics and curriculum development concerning SWVDs (Kasiram and Subrayen, 2013).

2.6.1 UKZN Policy on Staff and Students with Disabilities

The University of KwaZulu-Natal released its official Policy on Staff and Students with Disabilities in July 2004. The document addresses the University's commitment to providing higher education that is accessible and inclusive for all students, including those with visual disabilities. The new policy saw the university committed to the elimination of cultural biases, structural obstructions, social and other barriers that prevent SWDs from entering university and obtaining education on the same level as all students (UKZN Policy on Staff and Students with Disabilities, 2004).

The UKZN Disability Policy for Staff and Students with disabilities (2004) was derived from the South African Constitution (1996). It applied a set of objectives that focused on acknowledging individual capabilities, full participation, accessible and safe environments, reasonable accommodation, access to the curriculum and other activities, equitable representation for persons with disabilities, non-discrimination and removing attitudinal and artificial barriers (UKZN Policy, 2004). The UKZN Policy (2004) acknowledges and complies with other legislation, which including:

- I. Employment Equity Act, 1988 (Act No. 55 of 1998);
- II. Code of Good Practice: Key Aspects of the Employment of People with Disabilities;
- III. Higher Education Act of 1997; and
- IV. White Paper No.6, Special Needs Education (2001).

The University of KwaZulu-Natal places strong emphasis on providing and maintaining an accessible environment for all students in line with UKZN's Policy on students and staff with Disabilities (2004). The policy focuses on providing reasonable accommodation for students with disabilities to ameliorate their participation in the classroom. The UKZN Policy (2004) promoted independent living that assured dignity, autonomy and responsibility. This aligned with the UDI principle (8) where the design allows use regardless of physical or bodily attributes; mobility and does not "single out" or stigmatise certain students. Singh (2017) found that this encouraged self-determination, an essential component for the success of SWVDs resulting in positive experiences. Self-determination is explained as helping SWVDs engage independently within the university environment to harness their strengths and abilities (Singh, 2017). However, the policy's last amendment date being 2004 shows that the UKZN is not proactive enough in updating policy.

It is evident from the UKZN Policy (2004) that the University of KwaZulu-Natal strives towards accessible environments inclusive of all students with disabilities. There is a strong possibility that the situation will improve in the long-term if UKZN embraced the paradigm shift that UDI proposes, demonstrating the progressive attributes expected of a university. In so doing, UKZN will be able to provide some hope for the transformation of entrenched attitudes and

practices (Singh, 2017). Parashar, Chan and Leierer (2008) claimed that it was important to understand the attitudes towards SWVDs given that such attitudes define the life experiences, opportunities and help-seeking behaviours of SWVDs. Therefore, UDI will undoubtedly, foster self-determination and offer creative ways to include SWVDs at a mainstream university. However, exclusively relying on policy alone to induce change will not promote the full participation of students with disabilities. Ngcobo (2006) argued that South Africa incorporated disability policies that surpassed other countries. However, with such education policies and legislation in place, South African Universities continue to experience political conflict that influences the provision of educational opportunities and equity for SWDs (Ngcobo, 2006). The broader socio-political structure of South Africa requires consideration (Harbour & Madaus, 2011). On the other hand, SWVDs need to be made aware of their rights to take advantage of the available opportunities and resources to realise their capabilities within a safe and accessible environment that UKZN provides (UKZN Policy, 2004).

UKZN has made considerable strides in widening access to its diverse student population, including SWVDs. This is evident from the UKZN policy (2004) section 11, where the University outlines the following:

- Academic courses can be modified to accommodate a range of disabilities without compromising academic standards or the “essential nature of the course”, including “fieldwork and practical/laboratory work provided that no hazard is created for the SWVDs or others associated with the activities” (UKZN Policy, 2004: pg.11);
- The University commits itself to avail alternative strategies for assessing SWVDs when their disability prevents them from participating on the same level as able-bodied students during assessments. Alternative strategies may include oral assessment, the use of adapted equipment and visual aids, amongst others;
- A student with visual disability can apply to the DSU when special equipment or arrangements are needed to facilitate participation in tests or examinations. The DSU is obliged to liaise with the Examinations Office for appropriate arrangements to be made to accommodate individual student needs; and

- The University supports teaching approaches that will assist students with visual disabilities with their studies. The policy further states that SWVDS or those with medical conditions will be permitted to utilise aids or be assisted during lectures and assessment processes as resources may reasonably permit.

It can be surmised from the above discussion that UKZN is and always has been complying with inclusive legislation, and displays readiness for the implementation of the much advanced internationally accepted system and paradigm shift that UDI offers. The university undeniably can conform to the seven principles of UDI and advance in the provision of an inclusive education system to its diverse student body.

It was supported by Kasiram and Subrayen (2013) that without active support to ensure that policy translated to practice, the consequence would be severe discrimination imposed on visually impaired students. The university policy includes accepting students with visual disabilities but Kasiram and Subrayen (2013) alleged that the university did not follow through with the facilitation of this process.

2.7 Visual Impairment and the Mainstream University Experience

Pandey (2018) indicated that Visual Impairment occurs when any part of the optical system is defective, diseased or malfunctions. He claimed that congenital visual impairment included missing parts of the eye such as the absence of the iris, the eyes themselves, defective systems (problems with eye lens or holes in the retina) and hereditary conditions such as improperly shaped corneas or albinism. Furthermore, visual impairment can stem from diseases pre-natal, at birth or post-natal, or gradually develop later in life, such as in diabetic retinopathy (Pandey, 2018.)

Students with visual impairment come to university from special schools, private or mainstream schools and, depending on their levels of support within each of these schooling systems, require services in diverse ways. Hewett et al. (2018) found that SWVDs benefited from accessible learning materials being made available in advance by drawing on their pre-existing skills and

knowledge. This impacted profoundly on their mainstream university experiences. As a result, a balanced approach was suggested in Hewett et al. (2018) for SWVDs on admission to a mainstream university.

In personal communication with DSU staff at UKZN (2019), it was revealed that there is one of two incidents usually present on admission to the university. It may be the case that the HEI fails to provide an inclusive learning environment or the SWVDs arrive without the necessary skills. How SWVDs and the university adjust to achieve success is fundamental in achieving success. It will be beneficial to the university to fulfil its obligation to SWVDs and provide an inclusive environment with strategies for nurturing the development of these skills once the SWVDs arrive and transition into HE (Hewett et al., 2018). Thus, the HEI will address problem areas arising from SWVDs that may have experienced sight loss later in their educational career and may not have gained from the advantages of early intervention strategies at school (Hewett et al., 2018).

Students with visual disabilities should request information about accommodations to meet their needs. To achieve these, SWVDs will need to be well aware of their visual status in terms of:

- Diagnosis
 - level of visual impairment (qualitative)
- Prognosis
 - is their visual impairment likely to change (improve or deteriorate- over time will they require more advanced accommodations to facilitate learning)?
 - is their visual impairment likely to remain the same for the duration of the study?

Thereafter, it needs to be established if the SWVD is aware of their level of visual impairment to request accommodations. This will lead to exploring whether UDI has added advantages to bring access to education:

- To blind students (a measure of blindness:- Legally blind but have light perception);
- Partially-sighted students; and

- Albinism- students who have light sensitivity are most likely to have low vision, added to the stigma of being light-skinned.

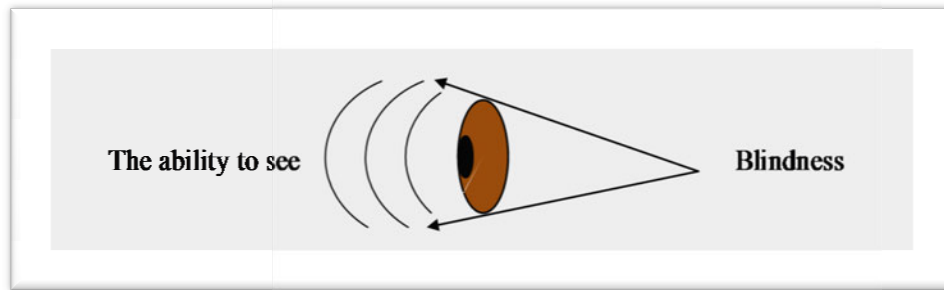


Figure 2.4: The Spectrum of Visual Impairment (Rajkonwar et al., 2015)

This study draws on research by Rajkonwar et al. (2015) who differentiate between blindness, partially-sighted and low vision. They explained that educationally, students who are blind use Braille partially-sighted are measured in terms of distance from the Snellen chart; and low-vision is described in terms of clarity reduction. There is sufficient research to validate the claim that SWVDs can be educated in a regular classroom appropriately equipped to meet their needs (Hewett et al., 2018; Dutta, 2013 and Rajkonwar et al., 2015). The deprivation of sight influences SWVDs in their adjustment and achievement. It stands to reason that a favourable environment and harmonious development influence SWVDs positively. It was agreed unanimously that SWVDs are valuable human resources within society and thus require opportunities. Dubois and Trani (2009) emphasised that increasing opportunities for people with disabilities and allowing them to choose amongst various available opportunity sets enhanced students' capability, thereby reducing the consequences of disability. It is for this reason that the current study corroborates several studies that aspire towards the provision of equal opportunities, inclusive education, protection of their rights and full participation in society (Hewett et al., 2018; Dutta, 2013; Rajkonwar et al., 2015; Sen's Capability Approach of the 1980's and Maslow, 1943/54).

2.7.1 Students who are Blind

In line with The Rights of Persons with Disabilities Act 2016 (pg. 33), blindness after best correction of the person's sight may be classified as follows:

- A total absence of sight;
- visual acuity less than 3/60 or less than 10/200 (Snellen) in the better eye with the best possible correction; and
- Limitation of the field of vision subtending on less than 10 degrees (Pandey, 2018).

Rajkonwar et al. (2015) added that another description of blindness might include tunnel vision. They conceded that according to the Snellen chart students are considered blind even if visual acuity is better than 20/200 (Rajkonwar et al., 2015). This implies that a legally blind person can see things at a 20 feet distance, whereas a sighted person sees with ease at 200 feet. (Dutta (2013) and Pandey (2018) concur that students who are blind are usually dependent on other senses to learn. Another important element to enrich the learning process of SWVDs is the quality of their educators. Educators need to be mindful of how they can make a significant contribution to enriching the learning process. Over the years, educational research has provided ample support for the assertion that a rich learning environment that takes into consideration multi-sensory learning in the classroom, which includes touch or smell, colours, shapes, people and landscapes, provided a wealth of information subconsciously (Dutta 2013 & Rajkonwar et al., 2015).

Consequently, it becomes relevant to distinguish between those who may have some sight and those who may never see at all in their lives. This may also significantly impact SWVDs from gaining opportunities for social relations (Pandey, 2018). Maslow's (1943/54) Hierarchy of Needs model lends support to Pandey's (2018) claim that visual impairment limits mobility, exposure and stimulation for gaining new knowledge and as such, affects the spontaneous decision of a SWVD to engage in or follow up on various pursuits of knowledge and happiness. It is interesting to note that visual perception and experiences permit students to control their environment and understand it in relation to the self (Pandey 2018).

When working with the blind, the following questions need to be considered (Dutta, 2013):

- How limited the learner's sight is to maximise learning?
- What skills do SWVDs have in terms of Braille and tactile skills?
- What level of experience do SWVDs have in terms of vision?
- How limited are SWVDs in terms of mobility? In other words, is the student moving around independently in the classroom?

2.7.2 Students who are Partially-Sighted

Partially-sighted learners make up the majority of SWVDs and have more variability in terms of the level of visual ability or impairment they have (Dutta, 2013). This could result in underestimating the difficulties in addressing their needs. It is imperative when working with partially-sighted learners to address the following questions:

- How stable, variable and under what conditions is vision optimal?
- How restricted is the field of vision?
- Which font size/style of print is comfortable for the student?
- What are the student preferences for the learning environment concerning lighting or their choice of location in the learning environment?

Low-vision learners mainly use their remaining vision to learn (Pandey, 2018). These students use magnifying devices. They may learn to use print by adapting font size or clarity (bold on white background). Low-vision may also include the following conditions:

- visual acuity not exceeding 6/18 up to 3/60 or up to 10/200 (Snellen) in the better eye with the best possible correction; or
- Limitation of the field of vision subtending on less than 40 degrees up to 10 degrees (Pandey, 2018).

2.7.3 The Impact of Visual Impairment on Learning

Visual impairment significantly impacts learning and limits students who pursue higher education in a mainstream setting. Pandey (2018: pg. 2563) conveyed that visual impairment imposes three basic limitations on the individual, namely:

- i. How restricted is the student in terms of the range and variety of classroom experiences
- ii. Is the student restricted in his/her ability to get about the classroom
- iii. Is the student restricted in the classroom environment

Dutta (2013) argued that there is no direct correlation between visual impairment and intelligence. There are similarities between the attitudes expressed in this study and those described by Dutta (2013) and Rahman (2019) that visually impaired people have the same range of intellectual ability as other students. On these grounds, one can argue that the problem arises when addressing the availability of opportunities to promote learning for SWVDs to acquire knowledge from a medium meant to be learned visually. For instance, students learnt maps by looking at them, whereas SWVDs can generally learn by feeling a raised map, a method not considered as efficient as seeing it (Rahman, 2019). On logical grounds, there is reason to argue that although students with visual disabilities have the same range of intelligence and abilities as their sighted peers, they may face additional barriers. By alleviating these barriers, SWVDs will be on par with their sighted peers by embracing a popular quote from singer and musician Stevie Wonder (Dutta, 2013):

"Just because a man lacks the use of his eyes, doesn't mean he lacks vision." Stevie Wonder

Based on the foregoing discussion, it can be argued that the introduction of UDI can improve epistemological access and promote learning outcomes for SWVDs in the classroom.

To enhance the understanding of the barriers experienced by SWVDs, the study draws on Maslow's Hierarchy of Needs model (esteem needs) which shows how the self-confidence of SWVDs can impact learning. When SWVDs have a reduced ability to recognise body language and facial expression, it poses a barrier that can influence the self-confidence of SWVDs and

influence their learning (Dutta, 2013). These barriers may include pertinent learning abilities such as working speed, communication skills that involve reading and writing, environmental and spatial awareness and social interaction (Social Model) (Dutta, 2013). This indicates a need to understand the various tactile and auditory channels applied as alternative measures to make education accessible to SWVDs.

2.7.4 The Success of Teaching and Learning in the Classroom

The study undertakes to explore the factors that influence the implementation of UDI for inclusive learning for students with visual disabilities in the classroom, such as the need for space to facilitate orientation and mobility (7th principle of UDI) that may include:

- Lighting;
- Technology; and
- Online access (Moodle) for students who are blind and partially sighted

To test the feasibility of a classroom at UKZN and to consider improvements, educators can be guided by some of the following questions (Dutta, 2013):

- Has the space been cleared and tidied to **allow** ease of movement?
- Where are frequently used resources kept? Is it kept in the same accessible place and is it labelled?
- Has the level of lighting been adapted for SWVDs?
- Are there accessible ICT devices available?
- Can one use objects to support one's teaching?
- Did one allow adequate space for special equipment that may be used, such as the storage of large print resources?

2.7.4.1 Strategies for SWVDs within the Inclusive Classroom

Applying UDI in the classroom has the potential to increase the chance that all students, including SWVDs, will have opportunities to learn, participate and express what they know. Universal Design of Instruction is therefore an appropriate strategy to be applied at the university as it will ensure that teaching styles, instructional materials and educational goals are designed and modified to fit the student's specific learning needs and abilities. As such, it will aid in improving SWVDs' visual learning experience and assist them to adapt to the different situations they may face at university (Salleh & Zainal, 2010). This may include how SWVDs demonstrate to educators what they have learned in a way that best matches their learning styles and strengths (Burgstahler, 2013). Rahman (2019) believed that achieving this end required the integration of a variety of strategies, creating a wealth of opportunities to learn, participate and express knowledge as illustrated in Figure 2.5 (Rahman, 2019).

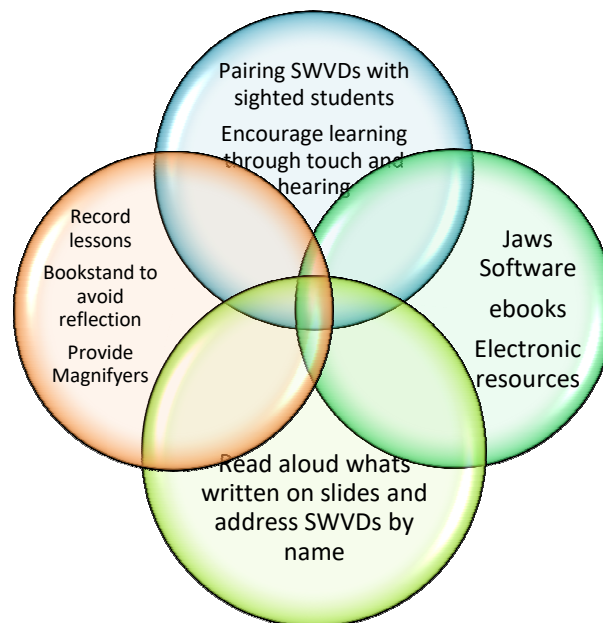


Figure 2. 5: Strategy Integration(Rahman, 2019).

The above diagram can be explained in detail as follows:

- Use large writing or encourage SWVDs to come close to the board or teaching aids to see more easily;
- Educators must read aloud what is written on chalkboards, whiteboards or slides;
- Provide magnifying aids;

- Use a bookstand to avoid reflection;
- Employ the handling of objects to encourage learning through touch as well as through hearing;
- Pairing SWVDs with a seeing classmate can assist him/her to organise their work or keep up with the lesson by, for instance, helping to find the correct page or repeating the instructions given by the lecturer;
- Address SWVDs by their names during class discussions so that they know they are being spoken to;
- The use of computer software (JAWS, ZOOM text) to support learners with visual impairment or convert into Braille; and
- The recording of lessons for later playback at home or as revision
- The use of eBooks or other electronic resources available in libraries (Rahman, 2019)

Salleh and Zainal, (2010) suggested the following interventions to be conducted in the classroom to help SWVDs improve and maximize social integration with other students: social skills, effective interaction with sighted students, physical and assertiveness skills.

Students with visual disabilities need to learn to be assertive. The activities carried out in the classroom should foster assertive behaviours, allowing SWVDs to share their experiences.

The findings in the study by Singh (2017) revealed that UKZN provides some assistance to accommodate SWVDs. Since UKZN is not well resourced to provide the level of support needed, SWVDs struggle to cope within the mainstream environment. Students with visual disabilities remain complacent and unaware of their human right to equal education, accepting the least provisions of accommodations by the university. Singh (2017) supported the view that the university might be under the misconception that it provides adequately for its diverse student body based on the complacent acceptance of sub-standard provisions for SWVDs driven by their attitudes. The little that SWVDs receive from the university is accepted as a beacon of hope against the obligatory accommodations that all HEIs have a responsibility to provide.

The predicament that confronts the university will be to establish whether the Student Services Division is well resourced to accommodate SWVDs. With a growing number of students with disabilities across five campuses at the university from 625 students in 2016 to 709 SWDs

according to 2019 statistics, the DSU can provide a support service on all campuses that is reasonable (UKZN Disability Support and HIV Aids Programme, 2016). However, students with visual disabilities are a diverse group of people and UKZN needs to improve services with more resources and support (Shaikh, 2017). Wessel, Jones, Markle and Westfall (2009) agreed that various support systems and programs and several offices across multiple divisions in collaboration with DSU are responsible for the students to move successfully through the university. Furthermore, the university should provide outreach and consultation to other campus offices and academic units to ensure the full participation of SWVDs.

Several studies provided research evidence demonstrating the many barriers faced by SWVDs in HEIs persuading educational institutions to review their models of support (Hewett et al., 2018; Kasiram and Subrayen (2013); Subrayen, 2011). As such, in securing appropriate, inclusive and accessible learning environments, this study contributes alleviating the challenges HEIs face by exploring the principles of UDI to make specific adjustments for SWVDs whilst working in collaboration with the learner (Hewett et al., 2018).

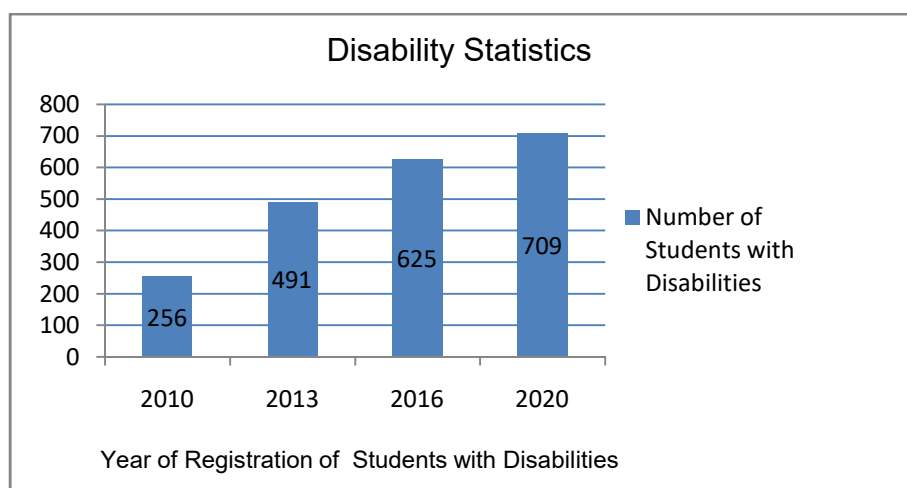


Figure 2. 6: Disability Statistics per Year (Shaikh, 2017 and Disability Statistics, 2016)

Statistics obtained from Shaikh (2017) and Disability DSU (2016) showed a clear indication of an increase in enrolment of SWDs over the years. Shaikh (2017) attributed this to active attempts

made by UKZN to accommodate diversity combined with a greater awareness of such accommodation efforts amongst SWDs, which included:

- The provision of information technology to format required information in accessible forms for SWDs;
- Awareness of special academic accommodations that UKZN provides to enhance teaching and learning;
- UKZN's application of international, national, and Higher Education declarations designed to equalise opportunities for PWDs; and
- Collaboration of UKZN with high-schools to alert potential students about the availability of Disability Support Services provided by UKZN.

Ntombela (2013) proclaimed that accommodations are a critical part of inclusion compelling institutions to address access issues. Therefore, to obtain a comprehensive understanding of accommodating disability in higher education, this study explored and evaluated a case study of the University of KwaZulu-Natal (UKZN) by Shaikh (2017).

Shaikh (2017) reported that SWDs are sporadically distributed throughout all colleges at the university based on their career choices. Based on Disability Statistics (2016), the College of Humanities has the majority of registered SWDs due to subject choices at the secondary school level. Shaikh (2017) explained that this was mainly due to the College of Humanities making provision for SWDs by accommodating students who do not meet specific entry requirements by introducing the access program, which other Colleges did not offer. The access program provides SWDs with the necessary support for entry into mainstream programs (Shaikh, 2017). However, Kasiram and Subrayen (2013) differ in their view and argued that SWVDs were often denied entry to their choice of study as the university did not fully understand how they will cope in careers such as teaching or where fieldwork was required.

In an attempt to assess the current learning environment, this study explored the strategies in line with the principle of universal design which entailed adapting to the mode of instruction to enable learners with visual impairment to be most proficient in learning. Temesgen (2018) added

that the major educational challenges of SWVDs lay in the poor provision of adapted material. Wells (2022) agreed that UDI in higher education is a useful tool in supporting the diversity of students at university especially in supporting student academic outcomes and retention. As such, the provision of appropriate support will ensure retention and minimize dropout rates. There is a range of equipment, facilities, educational arrangements and provision of services in line with UDI that can be applied for the successful inclusion of SWVDs (Rahman, 2019). Some of these include:

- Orientation and mobility (Cane skills);
- Portable note taker;
- Larger format books;
- Slate and stylus;
- Magnifying glasses;
- Specialized computer software (Jaws, Zoom Text etc);
- Electronic Braille writer; and
- Perkins Braille (Rahman, 2019).

Izzo (2012) added that delivering content requires the lecturer to be mindful of the risk of losing the attention of SWVDs. Izzo (2012) outlined the following ways to enhance engagement and retention to increase the achievement of SWVDs:

- Students with visual disabilities learn better when they are actively engaged by answering questions, discussing content or applying what they have learnt to actual problems;
- By providing guided notes, lecturers can motivate SWVDs to think independently;
- Increasing time for engagement with content; and
- Listening to SWVDs talk with their peers about the content.

A range of avenues is available to integrate SWVDs at HEIs. Therefore, lecturers need to prepare the classroom in advance for SWVDs to facilitate orientation and mobility. This would give SWVDs a sense of where other objects and students are in the classroom. In other words,

SWVDs need to know where furniture, doorways and bookshelves are to identify where they are in the classroom. This will assist the SWVDs move from the classroom to other venues promptly. Therefore, it is the lecturer's priority to ensure that the classroom is spacious and furniture is well arranged to enhance learning opportunities for SWVDs (Rahman, 2019).

Other strategies involved accessible resources and time management, important to strengthen their learning (Dutta, 2013). Routinely, SWVDs will require extra time to process information and complete tasks. This adheres to UDI principle (3) that using the simplest formats can help SWVDs. It therefore becomes mandatory that support staff have the time to modify materials to include larger print or a print and a digital copy and other modifications to course materials well in advance (Dutta, 2013). This study explored a broad spectrum of ideas on how to implement UDI and the effect of its application. Consequently, research proved that educators might not be aware that pre-created versions, Braille materials, audio-visual resources and tactile pictures and diagrams are available for a particular course from the educational supplier who has bought into universal design practices (Dutta, 2013).

2.8 The Importance of Technology in Broadening Access to SWVDs

Tomozii and Topală(2014) observed that the new Millennium brought with it an influx of information and technology that stimulated a process of change that seemed to grow exponentially. Based on current evidence, it is fair to suggest that technology has enormous potential for supporting SWVDs across diversities and capabilities (Dutta, 2013; Burgstahler, 2013). Burgstahler (2013) revealed in a study that technology broadens access by providing flexibility and multiple means of engagement without altering the content of the curriculum. This coincides with Ngubane-Mokiwa (2016) and Massive Open Online Courses (MOOCs) designed to enhance access to education for all. However, this approach de-institutionalised education in the same way that COVID-19 did in moving it from the formalised classroom setting to the open platform.

Assistive technology such as audio-visual devices or software, vodcasting, podcast/media server and the digital pen all permit students to work independently and at their own pace. On the other

hand, being successful also requires the correct device, training and time (Dutta, 2013). A step towards making education an inclusive process is to embrace technology in order to open doors. However, only institutions open to the specific needs of SWVDs can recognise the impact it has on their learning and social integration (Dutta, 2013). Mousavi and Dargahi (2013) insisted that new ways need to be explored to remain responsive to the needs of SWVDS. As such, this study explored the principles of UDI where technical support is incorporated into a curriculum design that targets the individual needs of SWVDs. Equipped with such technical support and with the skills to use it, places the SWVDs in a position to be in control of their learning journey, improving their academic progress and their self-confidence in learning and their life (Dutta, 2013), thus employing the principles of two models applied in the study, the Social Model of Disability and Maslow's (1943/54) Hierarchy of Needs.

2.8.1 Wide-scale Implementation of Technology

The enormity of a global emergency compelled the rapid implementation of advanced technology previously considered impossible (Frankfurt, 2020). From a positive perspective, this crisis can be viewed as a jumpstart in applying the universal design system that incorporates technological processes and thought patterns that would have taken much longer to implement at a time of relative peace. Frankfurt (2020) iterated that a positive takeaway from disaster is its recurring ability to turn something once viewed as impossible into an accepted aspect of a new reality.

The principles of universal design have advocated the equitable use and viability of higher education institutions by moving to virtual teaching environments for well over a decade (Frankfurt, 2020). The Coronavirus 2019 (COVID-19) pandemic fast-tracked years of deliberations and concerns and forced educational institutions to re-evaluate their delivery methods across all aspects of teaching, campus life and extracurricular activities (Frankfurt, 2020). This is the kind of response that the study intended to initiate and demonstrates that the university clearly can become more inclusive for all its students. The response to the pandemic acted as a catalyst for the implementation of the universal design system that the study proposes.

2.8.2 Flexibility and Accessibility of Design: Remote Learning

Major strategic shifts that had been at work for years, such as UDI, came under scrutiny in the wake of the global pandemic. For instance, a learning platform launched in China where study materials for all students (junior and senior high-school levels) were available on a cloud (Frankfurt, 2020). Furthermore, China incorporated public broadcast learning into its domestic education strategy with dedicated public television channels airing primary-school class material, compelling widespread innovation across the Higher Education sector (Frankfurt, 2020).

In a short space of time, the response to the virus had demonstrated its influence in forcing widespread innovation across the Higher Education sector (Frankfurt, 2020). The impact of the pandemic on learning platforms was not seen as a 1-to-1 replacement of the physical classroom learning experience but as a short-term supplemental program. It stands to reason that a viable way to incorporate the UDI model would be to implement its strategy alongside existing approaches (Frankfurt, 2020).

Frankfurt(2020) asserts that versatile virtual technologies can maintain the standard of education. Wells (2022) concurred with Frankfurt (2020) that the switch from face-to-face teaching to virtual formats demonstrated a vital need for flexibility and supportive learning strategies for students and academic staff unfamiliar with such learning formats. With the arrival of 5G technology, Frankfurt (2020) professed that the in-class experience will advance allowing instructors, students and technology providers to take *"anytime, anywhere learning"* much further. However, only 60% of the world's population currently uses the internet due to a major gap in socio-economic equity (Frankfurt, 2020). A similar situation confronted South Africans and the vast inequalities that persist decades after its democracy. It stands to reason that to broaden the viability of virtual learning, socio-economic inequities need to be addressed as the negative effects of the divide are exacerbated in times of crisis (Frankfurt, 2020).

2.8.3 Critique of Technology

Both current and recent research seems to validate the view that deficiencies in the higher education system have left SWVDs vulnerable in the COVID-19 episode where outdated practices have seen many students fall behind in the sudden transition to online learning (Subbiah, 2020; Shaikh, 2017; Ngubane-Mokiwa, 2016). Wells (2022) emphasized that higher education instruction has not changed significantly. This was verified by the fact that students at university utilising online platforms for learning are diverse in terms of disabilities and other aspects including languages and cultural barriers and lacked substantial skills (Wells, 2022). Therefore to meet the diverse needs of incoming learners such as SWVDs, UDI that supports inclusive teaching methods must be investigated and systematically implemented to support these learners.

Students with visual disabilities have often expressed frustration that technological formats do not support assistive devices and software products. Ngubane-Mokiwa (2016) claims that this is owing to technology developers who are discouraged due to the exorbitant costs of technological initiatives to pursue innovative designs such as those recommended by UDI principles to make learning environments accessible. Technology developers advised that innovative designs take longer to develop and require specialised design skills, compounded with the fact that there is a small target market for specialised design, which also raised challenges with accessibility support. Rather than facilitating use for all students in catering for different disabilities, such challenges with technological initiatives excluded other users (Ngubane-Mokiwa, 2016). Subbiah (2020) established that providing comprehensive disability support to SWVDs could ironically hinder their progress if such supports were not available when they transition from university into mainstream society. However, the rapid transition to online learning provoked by COVID-19 forced SWVDs to gain a higher level of digital independence, allowing them to integrate into mainstream society and compete with their peers more equitably. Therefore, Subbiah (2020) recommended that institutions begin to adopt digital or blended teaching and learning pedagogies in response to COVID-19.

Contemporary theorists concur that virtual technologies require the playing field to be levelled for all students, including SWVDs, when it comes to access to technology (Frankfurt, 2020;

Subbiah, 2020). Students with visual disabilities entering the university have limited exposure to technology and digital platforms in the Basic Education sector. Therefore, Subbiah (2020) maintains that a comprehensive level of disability services is necessary to acclimatise SWVDs to the higher education environment. Although there have been advances in the development of specialised assistive technologies (such as Smartphones) carrying assistive software to allow total access to the digital environment, the lack of familiarity with commercial and specialised technologies led to South African persons with visual disabilities being side-lined. Some of the challenges that SWVDs face include:

- accessing data;
- adequate network coverage;
- required technology; and
- having to work in non-conducive environments.

The willingness to reduce the digital divide speaks to the understanding that online teaching is about far more than just technology (Frankfurt, 2020). Concluding that support is needed by both the learner and the instructor, Frankfurt (2020) asserted that such a mindset is critical to both short-and long-term recovery from the negative effects of a pandemic. The majority of SWVDs have realised that the sudden transition to virtual digital platforms due to the emergence of COVID-19 compelled them to embrace technology with a more positive outlook towards pursuing careers in mainstream society (Subbiah, 2020). Subrayen (2011) contends that academics need to follow through and promote social and economic equality and address the challenges that the pandemic has presented, form an academically inclusive relationship with SWVDs and create an environment of access, participation, non-discrimination, academic success and equity. The pandemic has provided an incentive for change to create avenues and offer incentives for academics to be empowered and trained on disabilities and virtual learning platforms, taking the initiative to teach strategies for PWVDs in the dawn of a new era/or the new normal (Subrayen, 2011).

Based on the principles of UDI, the essence of online learning should be focused on providing flexibility and accessibility to all within the Higher Education sector, thus enabling students to reach greater heights when faced with unprecedented circumstances. The lesson the pandemic teaches is the importance of online flexibility which is fundamental for the sustainment of education and overall well-being (Frankfurt, 2020). This aligns with Maslow's (1943/54) Hierarchy of Needs. Working remotely has also been found to reduce disability stigma and the need for disability disclosure (Subbiah, 2020). Consequently, Frankfurt (2020) stressed the importance of assessing institutions, organizations and online habits to be better prepared at a time of historic upheaval such as the COVID-19 pandemic (Frankfurt, 2020).

Debate continues around the role of funding in the management of increasing numbers of SWVD accessing higher education. Subbiah (2020) professed that access to Higher Education was made possible, particularly via the Disability funding instrument, the National Student Financial Aid Scheme (NSFAS). Contrary to this, Shaikh (2017) argued that many SWDs do not qualify for NSFAS bursaries, evident in the fact that SWDs are disadvantaged as they experience challenges in accessing the essential assistive devices required to optimise learning. The situation at UKZN is one of budgetary constraints leading to confusion regarding how funding should be devolved to Disability Services Units on all campuses (Shaikh, 2017). It was suggested in Shaikh (2017) that UKZN needed to revert to appropriate methods in terms of:

- Budget allocations for its personnel, supplies and services and capital equipment needs and
- Outsourcing the cost of reformatting course material for SWDs to individual faculties via student fees.

2.8.4 Massive Open Online Courses (MOOCs)

Another study that advocated the Universal Design of Instruction includes Ngubane-Mokiwa's (2016) study on Massive Open Online Courses (MOOCs) designed to make online learning accessible to people with visual impairments. To enhance access to education, Ngubane-Mokiwa (2016) disclosed that in South Africa, UDI is a product of human rights and special education

legislation to best inform educational practices. Ngubane-Mokiwa (2016) uses UDI principles as a lens through which the accessibility of MOOCs to people with visual impairments is examined. Ngubane-Mokiwa (2016: np.) applied the following 3 principles in collaboration with UDI principles to provide a more accessible learning environment:

- I. “Multiple means of representation”;
- II. “Multiple means of action and expression”; and
- III. “Multiple means of engagement”.

An interpretation of Ngubane-Mokiwa's (2016: n. p.) principles in comparison with the principles of UDI is illustrated in Figure 2.7.

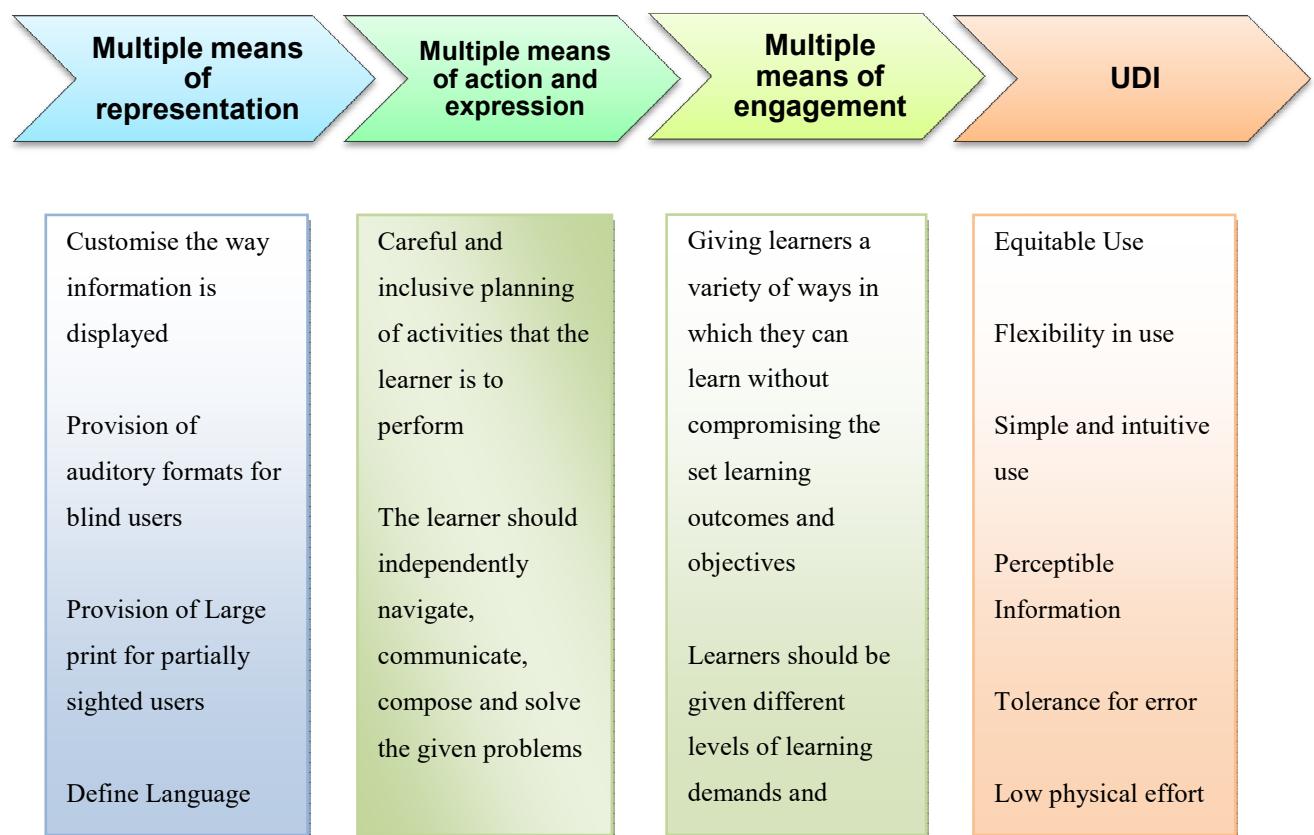


Figure 2.7: Three Principles in Collaboration with UDI Principles to Provide a More Accessible Learning Environment (Ngubane-Mokiwa, 2016)

The arrival of the Covid-19 induced lockdown made things worse as the lockdown caused all educational institutions to come to a halt, forcing management to come up with operational strategies without proper planning. The abrupt closure of the DSU and the university at large led to acute teaching and learning-related challenges for students with visual disabilities. The rapid move to fully online teaching and assessment led to the heightened exclusion of SWVDs at different levels of the system. Ngubane-Mokiwa (2016) divulged three ways in which digital exclusion can occur, illustrated in Figure 2.8:

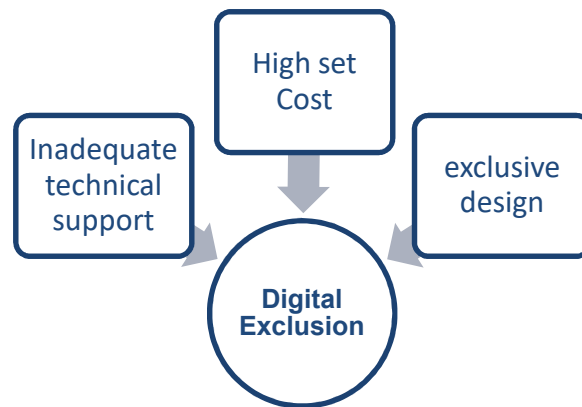


Figure 2. 8: Digital Exclusion (Ngubane-Mokiwa, 2016)

Ngubane-Mokiwa (2016) revealed that not every virtual learning platform is accessible to all SWVDs. Massive Open Online Course design can heighten accessibility, but it proved to be inaccessible for people with visual impairments, particularly blind people. Furthermore, Ngubane-Mokiwa (2016) reiterates findings in other studies that proclaimed blind students to be more affected by the exclusionary design practices than students with low vision. However, SWVDs are not requesting that the curriculum be tailored to suit their needs, as they expect that online platforms adopt more accessible modes of operation. For instance, students with visual impairment are often challenged with the inaccessibility of graphic and video content. Ngubane-Mokiwa (2016) suggested that overcoming these challenges required all graphical and tabular information to be accompanied by textual descriptions to enable SWVDs to understand what the contextual formats comprised. Ngubane-Mokiwa (2016) therefore cautioned that the process of designing any online learning platform requires ensuring that there is ongoing testing and re-testing of the platform by people with visual impairments.

Online platforms encourage open access to education to the masses. However, consideration must be afforded to design appropriateness as design could further alienate people with visual impairments (Ngubane-Mokiwa, 2016). Universal Design of Instruction provides clear guidelines that could assist in making online platforms accessible and conforming to these guidelines as discussed earlier could lead to the design of an accessible virtual online learning system that is inclusive to all students at HEIs.

2.9 Proposed Strategies for SWVDs in the Classroom

To help researchers, policy-makers and educators within the educational sphere, Rajkonwari et al. (2015) proposed the following:

- Various dimensions of adjustment can be addressed by different types of curricular activities such as dramatizing a lesson and employing other senses such as touch. This is expressed in UDI principle (1) on equitable use, where the design of a lesson must be usable by all in the classroom.
- Educators should promote the interaction of SWVDs and their sighted peers in the classroom to improve adjustment. Highlighting UDI principle (5) that addresses tolerance for error, the authors maintain that students are not different from SWVDs who may be just like or sometimes more efficient in certain activities than any other student.
- Universal Design of Instruction motivates a flexible design that considers social acceptance, social co-operation, and cognitive, affective, and psychomotor development to help sighted students accept the normality of visual impairment in their peers with visual disabilities.
- Promote the integration of SWVDs in mainstream institutions because the inclusive approach promises improved adjustment to society. Thus the satisfaction of the need to belong and feel included (Maslow, 1943/54).

2.9.1 Early Intervention

In personal communication with the disability specialist at UKZN, it was pointed out that another important aspect included understanding the intervention from the onset. Evidence for early detection, diagnosis and intervention is borne out by research supported in Pesovaa, Sivevska and Runceva (2014) and Rajkonwar et al. (2015). The literature shows a consensus that the early identification of and intervention of visual impairments impacts learning outcomes and the success, progression and throughput of the SWVDs. Ferreira and Sefotho (2020) advised that SWVDs undergo many transitional phases throughout their lives. Therefore, by putting systems into practice from their early years, this can assist learners to develop necessary skills and also acquire tools to become independent. They can in turn successfully transition through all stages of tertiary education ultimately fulfilling their role as valuable contributing members of society.

They suggested that educators should not await difficulties in students to reinforce interventions. The university may be faced with SWVDs who are:

- Born blind
- Susceptible to blindness
- Exposed to intervention programs

Engaging and learning will initially be challenging when intervention and corrective measures are introduced, therefore:

- Early intervention ensures that SWVDs will have all the skills;
- If not, UKZN needs to incorporate co-curricular training into the degree structure as SWVDs will come to university without any skills; and
- They will need to adapt to support that is offered.

This is supported by Pesovaa et al. (2014) who declared that early intervention suggests that institutions should not await difficulties in students to reinforce measures. They should rather find students at risk as early as possible. The main goal of early intervention is to empower SWVDs to be educated about what is available to assist them in HEIs.

Controlling the difficulty of the tasks takes a holistic view ensuring that prevention and early intervention in education is allocated at different levels, where it starts with effective exercises designed for the whole class and thereafter offering support to SWVDs. According to Pesovaa et al. (2014: pg.705), this can be achieved “by including monitoring of outcomes and monitoring of progress as part of teaching within the whole class”. Furthermore, the adjustments of tasks according to the abilities of the SWVDs and their skills will ensure high achievement and are associated with improved academic outcomes. The key to early prevention/intervention in SWVDs is the proportion of the teacher-student interaction which is reliant on the size of the class. It was suggested by Pesovaa et al. (2014) that the smaller the class, the greater will be the interaction between instructors and students. Students will have individual attention from instructors which will assist them focus on their work. The instructor will be able to better monitor and provide feedback and as a result, students perform better. Smaller classes also have a reduced variety of SWVDs and how they learn. This in turn impacts the different ways of teaching SWVDs. Furthermore, the size of the class will affect the quality of communication and allow instructors to tailor to the individual needs of SWVDs.

2.9.2 Variations in Visual Impairment

Similar to UDI, the design must offer support to the students that need it by monitoring the outcomes and their progress as part of teaching within the class. For SWVDs to benefit optimally from inclusive education, the student has to be formally and clinically assessed in terms of their visual efficiency. This can be effectively achieved using a Snellen chart developed by a Dutch doctor, Herbart Snellen, to assess the visual ability of the eye to see distant objects clearly (Rajkonwar et al., 2015; Pandey, 2018). Along similar lines, Rahman (2019) explained that **Snellen's "E" and "N" charts** are practical assessment tools used to determine the nature (type and degree) of disability inherent in each individual with visual impairment. This assessment tool is especially beneficial to lecturers and educators as the outcome of such assessments will facilitate the provision of materials and support services to meet the unique needs of each SWVD.

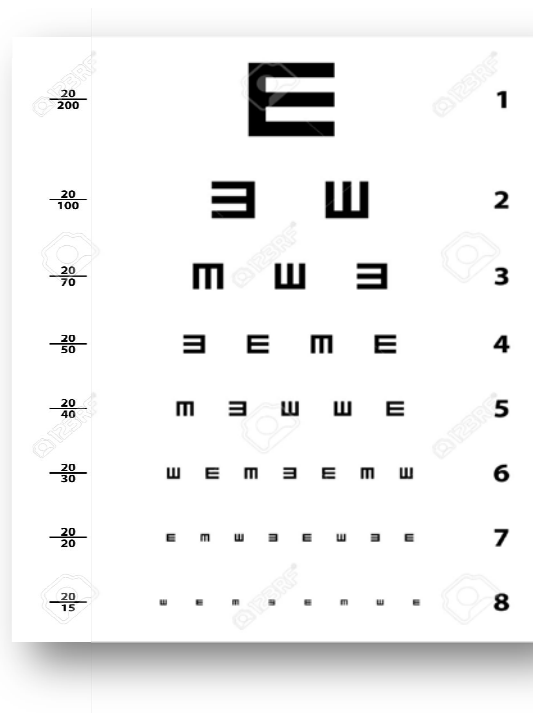


Figure 2. 9: Snellen Eye Chart (Rajkonwar et al., 2015; Pandey, 2018).

Dutta (2013) acknowledged that not all visual impairment is the same. The underlying argument by Dutta (2013) pointed out that the main functional effects of visual impairment include central or peripheral vision loss, poor image sharpness, low contrast sensitivity or adaptability to light, and impaired eye movement or colour loss. On this basis, Dutta (2013) emphasised referring to what can be seen, rather than what cannot. It follows that by adopting this mindset, educators can take full advantage of the learner's level of useful vision, thereby meeting distinct the individual needs of SWVDs as well as applying appropriate learning approaches to meet those needs.

2.9.3 Intervention Strategies to Cope with Mainstream University

Pesovaa et al. (2014) conveyed that prevention and intervention are linked and promoted mentoring in addition to teaching. Mentoring by trained volunteers or students was highly effective and resulted in improvement in the academic performance of SWVDs. This is similar to the buddy-system proposed in Singh (2017). It is expected that at university, interventions that are in place be regularly assessed; interventions should be specific to the needs of SWVDs; their

performance should be monitored weekly and teaching methods adapted to their needs (Pesovaa et al., 2014). Early identification is essential as it can detect the level of visual impairment from the earliest entry into HE that may be an obstacle to further learning.

Kavale, Holdnack and Mostert (2005) introduced Responsiveness-to-Intervention (RTI), a model that identified interventions that focused on student outcomes rather than their weakness. This relates to Maslow's (1943/54) Hierarchy of Needs model, shifting the focus to positive aspects of human behaviour or a focus on their strengths. This model involves early intervention and is a preventive model (Kavale et al., 2005). According to Kavale et al. (2002), RTI includes interventions based on scientific research and uses students' response to the intervention to refine and adapt interventions. Furthermore, a variety of RTI models exist that usually include quality interventions, mentoring and focuses on individual interventions.

An efficient approach to early prevention and intervention is to use a curriculum effectively designed for the whole class (Kavale et al., 2002). The university can take a stance on providing its intervention strategies to help SWVDs cope with the transition from high-school to university and familiarise themselves with university life. According to Juklová and Ulrichová (2011), intervention strategies may include:

- Activities such as a class excursion with an accompanying program followed by a multi-cultural picnic;
- A sporting event in support of disability awareness such as "Tearing Down Barriers" (Juklová Ulrichová, 2011, pg. 1229);
- Introductory workshops exploring diversity;
- Sharing experiences at regular meetings;
- Creating classroom themes with a focus on verbal and non-verbal communication; and
- Engaging in classroom activities that help develop:
 - Creativity and a sense of humour
 - Learning to work with feelings
 - Initiatives that promote acceptance of one's body

- Initiatives that help the student recognise the needs of others
- How to be assertive
- Exploring coping strategies
- Exploring prejudices and stereotypical perceptions of others (Juklová&Ulrichová, 2011).

2.9.4 Exploring the Characteristics of Persons with Visual Impairment

Visual impairment is distinguished by various characteristics such as degree of visual impairment, the age of onset, cognitive ability, language development, motor and mobility development, and emotional development (Rahman, 2019). The foregoing statement is underpinned by both the Social Model and Maslow's (1943/54) Hierarchy of Needs model. In satisfying the purpose of this study, the visual efficiency of the student will be considered. Rahman (2019) explained that the visual efficiency of SWVDs refers to the efficacy of their present vision. Students with visual disabilities exhibit the following characteristics:

- The intellectual abilities of SWVDs are the same as sighted peers;
- Sight cannot be used to assist them in the development of concepts;
- Tactile experiences are important for concepts development;
- Do not use visual imagery;
- Do not use non-verbal cues;
- Do not use spatial information and visual imagery and have imagery problems with functional implications;
- Poor hand-eye coordination;
- Distinguishing similarly shaped letters such as 'b' and 'd' is difficult;
- Have difficulty writing within the lines;
- Have difficulty reading books within the normal font;
- Are sensitive to bright light; and
- Difficulty in seeing in dim light (Rahman, 2019).

To effectively meet the needs of SWVDs, the foregoing classification prompts educators to raise the following:

- Is vision correctable?
- Low-vision eye pathology such as Retina Pigmentosa and other eye conditions
- Low-vision is measured on font size (how big a font size) and contrast (font against a specific background colour); and
- The greatest variations occur with low-vision (relate UDI to LOW vision).

The progression of visual impairment affects a person's self-perception and capability/self-esteem which will be addressed by Maslow's Hierarchy of Needs, one of this study's frameworks. A person is in a situation of visual impairment where a situation is defined in Majerova (2017: pg. 702) as "a set of conditions in which an individual is present". In the context of education, one speaks of students in a situation of impairment within a mainstream university environment.

2.10 The Impact of COVID-19 on the South African Education System

This study commenced during a time when South Africa and the world waged a battle against the novel coronavirus. The pandemic presented a set of unprecedented challenges. All stakeholders engaged to save the 2020 academic year while simultaneously trying to focus on the transformation and expansion of opportunities in the HE system. The coronavirus 2019 (COVID-19) pandemic plagued the country with immeasurable human suffering and indignity for many. The enormity of its effects had far-reaching consequences, felt most by marginalized populations amongst which are persons with disabilities. Hence, the need to re-formulate the higher education system becomes paramount to accommodate the intersections of disability and COVID-19. This study introduces the possibility of a Universal Design of Instruction during a time when our continent and the world were confronted with a pandemic.

The World Health Organization's (WHO) International Health Regulations Emergency Committee “declared the outbreak a public health emergency of international concern” (PHEIC) on 30 January, 2020 and South Africa activated its Emergency Operations Centre (EOC) on 31 January 2020 (DBE Standard Operating Procedure, 2020: pg. 4). South Africa's first case of COVID-19 was confirmed on 5 March 2020 by the Minister of Health, Dr Zweli Mkhize (DBE Standard Operating Procedure, 2020). South Africa's response to the pandemic was instantaneous and on 15th March 2020, the first internal transmission of COVID-19 was announced by President Cyril Ramaphosa. He then declared a National State of Disaster and a partial travel ban. President Ramaphosa announced travel advisories and discouraged the use of public transport. Schools and institutions of HE closed and gatherings of more than 100 people were prohibited (DBE Standard Operating Procedure, 2020).

The researcher found it necessary to highlight the magnitude of the pandemic to contextualise its significant impact on this study. Based on the DBE Standard Operating Procedure (2020), COVID-19 is a respiratory illness caused by a novel (new) virus, and more is learnt about it every day. The study commenced at a time when there was no vaccine available to protect people against COVID-19. Thus, the best way to prevent infection was to avoid exposure to the virus. To stop the transmission or the spread of the virus, everyday practices proved to be the only defence people had to remain in good health.

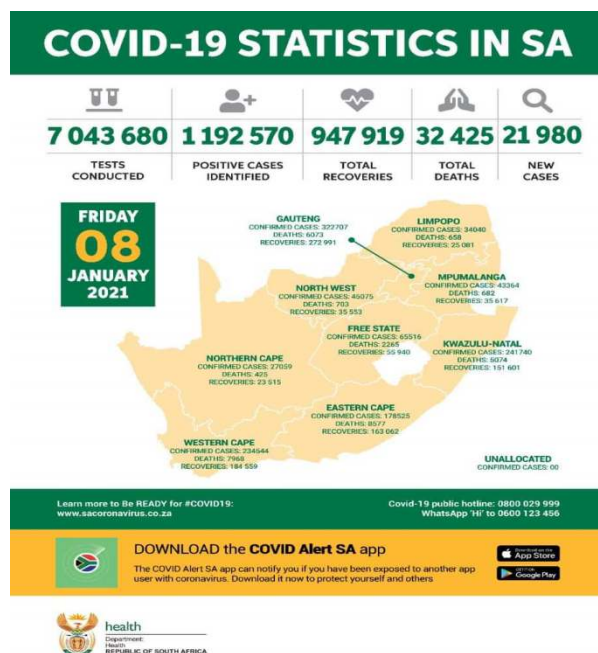


Figure 2.10: The Magnitude of the Pandemic (DOH, 2021)

This study will not go into a lengthy discussion about COVID-19. However, if required, more information on COVID-19 is available from the National Institute of Communicable Diseases website (NICD online, 2021), the Department of Health (DOH online 2021) and the Department of Basic Education (DBE Standard Operating Procedure, 2020).

2.11 Narratives from the International White Cane Day at UKZN

The University commemorated The International White Cane Day on 15th October 2020 via the Zoom platform, which paved the way for SWVDs to voice their difficulties in their navigation of the university, revealing the psychological and social challenges entrenched within the higher education environment. Balakrishna (2020) confirmed that there are currently 256 visually-impaired students at UKZN, 37 of which are blind and make use of the white cane to navigate the University. Nevil Balakrishna, the Disability Coordinator for the Howard College and Medical School Campuses at UKZN, stressed that blindness had prominence in Disability for different reasons. From a grave negative past to a promising future lie great legends such as James Biggs

who lost his sight in an accident at the peak of his career and invented the white cane in 1921. James Biggs had to adjust to his environment and painted his walking stick white to make himself more visible to motorists (Strong 2022). Louie Braille became blind at age 3 and invented a system of dots that opened access to learning for the blind. John Milton of the 1600s also became blind at age 47 and wrote "On his blindness", a prayer to God bearing the infamous words expressed in the form of a sonnet:

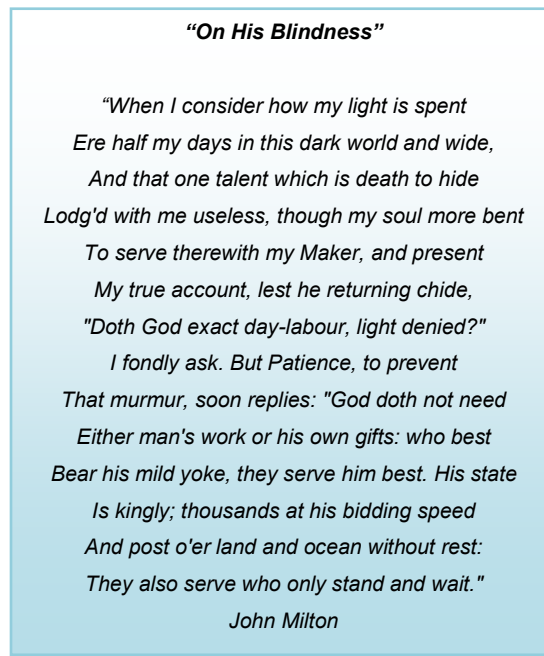


Figure 2.11: On His Blindness by John Milton (1673)

At age 47 when he became blind, John Milton expressed his feelings in the renowned poem "On His Blindness". The poem is a prayer to God where Milton questions the legitimacy of God. He believed that God had taken from him his precious sight (OwlEyes.org, 2021). How could he now be expected to serve God? It was only to be learnt later that his talent did not lie in his sight but in the absence of it. Losing his sight ironically opened his eyes to the world of the blind and the partially sighted to experience writing, reading and navigating the world from within, inspiring great works that gave birth to the discipline of Independence Training.

Strong (2022) refers to the Social Model of disability applied in this study, embracing the philosophy that barriers against people with visual disabilities are discriminatory attitudes and practices created by society. Blackman and Maynard (2008) supported the argument that barriers

to education and employment were impacted by the attitudes of lecturers, staff and mainstream students at the university because SWVDs educated in inclusive HEIs possessed interpersonal and leadership skills essential to the world of work. Gallego and Busch (2015) emphasized that there is a significant need for ongoing awareness-raising and training. As such, Juklová and Ulrichová (2011) proposed that awareness-raising can be achieved through transforming entrenched attitudes through shared experiences aimed at strengthening the interaction between SWVDs and other students. Furthermore, sharing existing physical, mental, social and cultural differences amongst students to cultivate an academic environment and develop the personalities of all involved is needed.

2.11.1 The Common Courtesy to Help Remove the Stigma of Blindness

According to the New Jersey Council of the Blind (2020), being informed removes the stigma of Blindness if simple points of courtesy are observed, as explained in a narrative from persons with visual impairment:

- I'm an ordinary person who is blind. Please don't raise your voice or address me like I am a child. Don't ask my friend or sighted companion for what I want. I would prefer you to ask me.
- I am happy to use a long white cane to help me walk independently, or I may ask to take your arm. However, I would like to be the one to make that decision and do not expect you to grab my arm. Allow me to take your hand and in so doing expect that I will feel safe to keep a half-step behind to anticipate curbs and steps.
- When you enter a room speak and inform me of your entrance.
- If you are accompanied by others, introduce me to them.
- Understand that a door to a room or cabinet or a car left partially open is hazardous to me.
- Words like "see" should not be avoided in my presents as it does not affect me. I also use this word for instance when I say I am happy to see you.

- A common misconception is that my sense of smell, touch, or hearing improved when I became blind. As a result of my blindness, I rely more on my other senses and I am therefore able to process advanced information through those senses.
- I do not need your pity nor do I not need to hear about the wonderful compensations of blindness.
- I need to be shown where the bathroom, windows and light switches are in the classroom and whether the lights are on.
- I have several other interests just like you however I will discuss my blindness with you if you are interested to know about it.
- I prefer to be considered more than just a blind person but a person who happens to be blind.

Balakrishna (2020) claimed that blind people deserve equality of opportunity and equitable access to resources so that they too may be able to reach their greatest dream, which is to participate in this society.

2.12 Disability Online Research and Practice Indaba 2020

The annual Disability Online Research and Practice Indaba is a knowledge generator that contributes to strengthening disability scholarship and practice from diverse perspectives and contexts (Disability Ndaba Online – University of KwaZulu-Natal, 2020). This study supports the hosting of this Indaba in that it is aimed at inspiring positive outcomes in an attempt to strengthen and enrich the disability knowledge economy, emphasizing their motto that "no student will be left behind". The Indaba featured international and national presentations, providing insight into disability and the emergence of COVID-19. The indaba featured delegates from Higher Education and the Public Sector to add value to the study's standpoint during a pandemic.

The university, in its response to COVID-19, took a strategic stance towards disability support and disability rights in higher education. This Indaba was intended to add to a body of new and critical knowledge to inform the design of inclusive developmental priorities for policy and

practice in higher education, which parallels the objectives of the current study in promoting inclusive learning through UDI.

This study aligns with the Research Indaba objectives in that it is enhancing research into disability support, transcends the rights-based context and embodies theoretical frameworks that embrace a collaborative strategy. For instance, this study applies Systems Theory (Becvar & Becvar, 2014) where all stakeholders internal and external to the university work collaboratively to initiate awareness to inform current and future strategies.

It was argued in Disability Ndaba Online – University of KwaZulu-Natal (2020) that PWDs are more susceptible to the risk of infection as they are more likely to possess co-morbidities. Students with visual disabilities are therefore more likely to be isolated and stigmatised in such instances, affecting their level of participation, state of mind and wellness (Maslow, 1943/54). It proved futile to apply intervention strategies developed for SWVDs before COVID-19 as they would not be appropriate in a lockdown situation. It was therefore, suggested that higher education institutions must actively engage in re-assessing and adjusting the approaches to be effective (Disability Ndaba Online – University of KwaZulu-Natal, 2020). This called for equitable education technology to ensure that learning is accessible and adheres to the principles of UDI. The Universal Design of Instruction becomes pivotal as a driver to ensure that all stakeholders at HEIs are informed, well-equipped and trained to make teaching and learning adaptive to provide a quality educational response to a pandemic.

It was established at UKZN's Disability Indaba (2020) that the unprecedented emergence of COVID-19 may remain a significant part of life for a prolonged period. It was unanimously agreed upon that COVID-19 did not just add to the inequalities of society, but revealed that little has been done to reduce it (Disability Ndaba Online – University of KwaZulu-Natal, 2020). Furthermore, SWVDs are at higher risk of infection. Therefore, the public health response to the COVID-19 pandemic for SWVDs at UKZN must be recognised and prioritised. Asprey and Nash (2006) supported that meeting the educational needs of SWVDs must involve adequate awareness of and provision for their health needs. Failure to address health issues would inadvertently affect full participation and attendance or access to the whole educational experience, including the curriculum and other activities in the classroom.

In addition, it was suggested that re-assessing and adjusting the approaches to addressing the needs of SWVDs should include effective and equitable education technology to ensure that learning is accessible. This paves the way for the introduction of new and effective global intervention strategies such as UDI, which requires the collaborative effort of academics and all students to be motivated, informed, well-equipped and trained to make teaching and learning adaptive to provide a quality educational response(Disability Ndaba Online – University of KwaZulu-Natal, 2020).

In the wake of a pandemic, the university had to make a sudden transition to online learning, which unveiled limitations in infrastructure and access to the requisite technology and proved to be a significant hindrance, resulting in reduced student participation(Disability Ndaba Online – University of KwaZulu-Natal, 2020).

Students with visual disabilities became anxious and overwhelmed as they now found themselves in isolation. Had Universal Design of Instruction been implemented earlier, it would have closed the gap between an extremely alienated living and learning style and a smooth transition to the new mode of learning.

2.13 Chapter Summary

The literature review covered a wide variety of theories from around the globe that align with the seven principles of UDI that respond to the study's objectives. Several theories explained the relevance and importance of inclusivity and equal access. Various terms were operationalised and unpacked to facilitate understanding in context. An array of literature supported the proposal that UDI simplifies the classroom experience by designing environments, products and services usable by everyone. Literature substantiated and grounded the UDI framework, postulating that educational design should benefit all students to promote access, participation and progress in the pedagogy for learners. Universal Design of Instruction strategies in the classroom focus on the potential to increase opportunities for SWVDs to learn, participate and express what they know. The literature motivates the application of UDI as an appropriate strategy to ensure that teaching styles, instructional materials and educational goals are modified to fit the student's specific

learning needs and abilities. A discussion of the concept of visual impairment in a mainstream environment ensued in order to understand the experiences of SWVDs at UKZN. A comparative overview of its versatility in Developed and Developing Countries focused on evolving standards over time and various types of disability systems. An exploration of legislation helped to understand how inclusive education in high-income countries and many low and middle-income countries have benefited from adopting accessibility policies. The literature review revealed an abundance of research on UDI in Higher Education globally, raising pertinent questions about UDI and its implementation in the classroom. Therefore, the current study explores efforts applied nationally and internationally to understand UDI implementation to facilitate the educational experiences and outcomes of SWVDs in the classroom. The information in the literature review is presented in various contexts and continues in Chapter Three, interrelating the four theoretical frameworks that underpin the study: The Social Model, Systems Theory, Maslow's Hierarchy of Needs and Sen's Capability Approach.

Chapter Three

Theoretical Frameworks Underpinning the Study

3.1 Introduction

This chapter presents and details the theoretical frameworks applied in the study. Various theoretical frameworks applied are used to derive certain testable assumptions in order to make sense of the quantitative and qualitative data. The overarching metaphor used to view the theoretical frameworks is that of a toolbox, where it gives structure to the data collection by zooming in on each theoretical framework's relevant sub-set of concepts (the tools). Each theoretical framework is described by expressing a clear understanding of its broad theoretical school and defining the key concepts with existing literature, the research questions and the problem statement. A conceptual model based on five existing applicable models has not been used before within a university context. Therefore, the successful implementation of a Universal Design of Instruction model can provide opportunities to align UKZN with the standards held by other leading HEIs globally.

3.2 The Aim of the Study in Relation to the Theoretical Frameworks

Through the analysis of the selected models of disability, the study aims to re-align the university to the Social Model of Disability, where it proposes to change the focus from students with visual disabilities to the inaccessible HE environment. This study explores a further three subsidiary models in support of the Social Model that was found to be applicable and predictive of outcomes in a study concerning SWVDs and inclusivity at a HEI. This includes Systems theory (Becvar&Becvar 2014), Maslow's Hierarchy of Needs (McLeod, 2014), including the opportunity to explore the expanded version of Maslow's model from a Disability context shown in Singh (2017), and Sen's Capability Approach. The interconnected constructs of the models are

merged with the principles of UDI to inform the proposed conceptual model. The principles and paradigms of the selected models of disability are analysed to achieve educational enhancement and thus inclusivity for SWVDs in the HE classroom. The models applied in this study provide a basis for a new framework through empirically acquired evidence that supports Universal Design of Instruction.

A brief recap of the aims, objectives and research questions will now follow. This will help the reader relate the theory to the overarching purpose of the study and how it corresponds with the applied theoretical frameworks. This study examines opportunities to incorporate the Universal Design of Instruction into the current university classroom. What is unique about this study is the evaluation of UDI as a single framework by interlacing the principles of selected models to achieve the enhanced capability of SWVDs.

The study applies Universal Design of Instruction (UDI) principles in the classroom to include students with visual disabilities in knowledge delivery. The study makes a unique contribution based on the experience and knowledge of the support sector perspective to conceptualise a predictive UDI model backed by the lived experiences of students with visual disabilities.

The objectives of this study were:

- I. To examine the experiences of students with visual disabilities with current teaching practices in the classroom;
- II. To determine the challenges experienced in learning for students with visual disabilities in the classroom;
- III. To explore the potential of UDI implementation to facilitate/maximise learning outcomes for students with visual disabilities in the classroom;
- IV. To identify factors that can influence the implementation of UDI for inclusive learning for students with visual disabilities in the classroom; and
- V. To propose a conceptual model that can incorporate UDI to promote learning outcomes for students with visual disabilities.

The main research question is:

- How can Universal Design of Instruction promote epistemological access for students with visual disabilities in the classroom?

The study will utilise a series of sub-questions to address the research question.

Sub-Questions:

1. What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?
2. What are the current challenges in learning for students with visual disabilities in the classroom?
3. How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?
4. What factors must be considered for the implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom?
5. What type of model can be conceptualised to incorporate UDI to promote learning outcomes for students with visual disabilities?

3.3 The Ontological and Epistemological Position of the Researcher

Each theoretical framework is explored based on the researcher's ontological and epistemological position. Researchers and participants interact as collaborative change agents and are not passive observers or interpreters of reality (Vianna & Stetsenko, 2014). Research is meant to intervene and disrupt the status quo, thereby promoting change towards equal access to knowledge through the inception of UDI.

The researcher's ontological standpoint is that reality is socially constructed and the practical intervention into human development would be through the intervention strategy that UDI offers

to bring about social change (Vianna & Stetsenko, 2014). The Universal Design of Instruction is essential for uplifting all learners, including students with visual disabilities, to the highest levels of achievement, thereby satisfying the need for self-actualisation proposed by Maslow (1943/54). As such, human development and learning can be understood as a collaborative and creative achievement by people acting together to effect change, and that such change will be a "work in progress" with no limitations (Vianna & Stetsenko, 2014: pg. 80). It is the view of the researcher that all human beings have unlimited potential and are equal, regardless of their uniqueness and diversities. Vianna and Stetsenko (2014) concurred that if provided with access to requisite tools within collaborative spaces of shared communal practices, all people are equal. The world is not fixed or "out there" and does not exist independently. It is constantly "in the making", in which all contribute in their unique way to the future that is created in the present through mundane deeds by common people in their ordinary lives, alluding to the fact that no person is common and no life ordinary (Vianna & Stetsenko, 2014: pg. 582).

Epistemologically, knowing is highly dependent on active participation and working collaboratively towards social transformation (Vianna & Stetsenko, 2014). Within the transformative paradigm, the research maintains that the truth obtained from the participants can be used in practice to empower and transform the lives of SWVDs. It is important to take a stance and commit. However, one needs to be cognisant that change is infinite and embraces versatility in open-ended dialogues with others who have different visions and commitments (Vianna & Stetsenko, 2014). In this way, the researcher's stance is exploratory in an attempt to discover new facts consistent in advancing current practices (Wagner et al., 2012).

This study employs more than one theoretical framework and drawing from the above discussion they are epistemologically compatible and help make sense of the data that relate to the gap of an exclusively unique combination within a university setting. Focusing on more than one theory provides a basis for a new framework through empirically acquired evidence supporting Universal Design of Instruction. This study explores four models found to be applicable and predictive based on their own set of principles and paradigms, all of which are significant in the development of a universally designed higher education environment. The set of principles and paradigms of each theoretical framework will be discussed in detail to adequately explain the theory and critically evaluate its position within the study.

Tools of the selected Models			
Maslow's Hierarchy	Social Model	Systems Theory	Sen's Capability
1. Self-actualisation: <ul style="list-style-type: none"> - Achieving one's academic potential - Academic Accomplishment 2. Esteem confidence in abilities <ul style="list-style-type: none"> - Achievement and success fulfil esteem needs as SWVDs gain respect and recognition from others. 3. Belonging and motivation <ul style="list-style-type: none"> - to achieve academically - Equal opportunity - Inclusivity - Participate equally in the classroom 4. Basic need satisfaction <ul style="list-style-type: none"> - Quality education - Sense of autonomy and Independence 	1. Social constructionism-impairment is socially constructed <ul style="list-style-type: none"> - Empower people to change current social viewpoints - Equal Access 2. Interaction SWVDs, lecturers and other students in the classroom: <ul style="list-style-type: none"> - Social circumstances (disabled by society) - External conditions - Stigmatisation 3. Attitudinal Change of lecturers and other students by the <ul style="list-style-type: none"> - Involvement of all stakeholders - Educational equity - Inclusive education 4. Reconceptualise the experience of impairment <ul style="list-style-type: none"> - Self-esteem - Personal confidence - Equal Participation in all aspects of learning and disability 	1. Relationships between SWVDs, and other students and lecturer in the classroom 2. Reciprocity (give-and-take actions), <ul style="list-style-type: none"> - Inclusivity - Holistic philosophy - Academic support - Interdependency 3. Wholistic approach <ul style="list-style-type: none"> - Working collaboratively in a system - Connectedness to all aspects of learning in the classroom. 4. Shared responsibility <ul style="list-style-type: none"> - Social interaction of SWVD, Lecturers and other students in the classroom - Participation of SWVDs in all aspects of learning in the classroom. 	1. Enhancing individual freedom <ul style="list-style-type: none"> - Respecting human dignity - Functionings- are states of 'being and doing' such as being well-nourished, having shelter, education - Capability - the set of valuable functioning that a person has effective access to. 2. Expanding capabilities (Enhance capabilities). <ul style="list-style-type: none"> - Academic Achievements - Basic need satisfaction - Dynamics of participation - Human diversity 3. Capability means opportunity to select. <ul style="list-style-type: none"> - Widening choices - Facilitate retention and throughput - Autonomy - Opportunities to achieve 4. Equity Equal opportunities for all people <ul style="list-style-type: none"> - Equal participation - Inclusive education system - Human development - Transformation

Table 3. 1: Constructs of the Models

3.4 Theoretical Frameworks

3.4.1 Social Model of Disability

Traditionally, the Medical Model of disability has subscribed to the belief “that disability is connected to the individual features of a given person and is their tragedy” (Zajadacz, 2015: pg.192). However, research has consistently shown that the effect of disability on the lifestyle of an individual is decided by how that persons’ surroundings and society denied them access to partake in that community (Zajadacz, 2015). The Social Model (Oliver, 2013) offered a paradigm shift in the social construction of disability, with the view that if a certain disability cannot be changed, then external situations must be modified and adapted otherwise PWDs might feel stigmatised and of less worth to society, “in general if seen only from the perspective of their dysfunction” (Zajadacz, 2015: pg.192). The foregoing discussion was supported by the WHO (2011:pg. 4) demonstrating a shift from a "Medical Model" to a "Social Model" in which people are viewed as being disabled by society rather than by their bodies. The Social Model of disability (Oliver, 2013) could provide possibilities to create overall inclusive university surroundings that promotes equivalent opportunities for everyone (Shava, 2008). Accordingly, this study draws on fundamental elements that the Social Model presents on the removal of barriers and its role in increasing the quality of life for SWVDs.

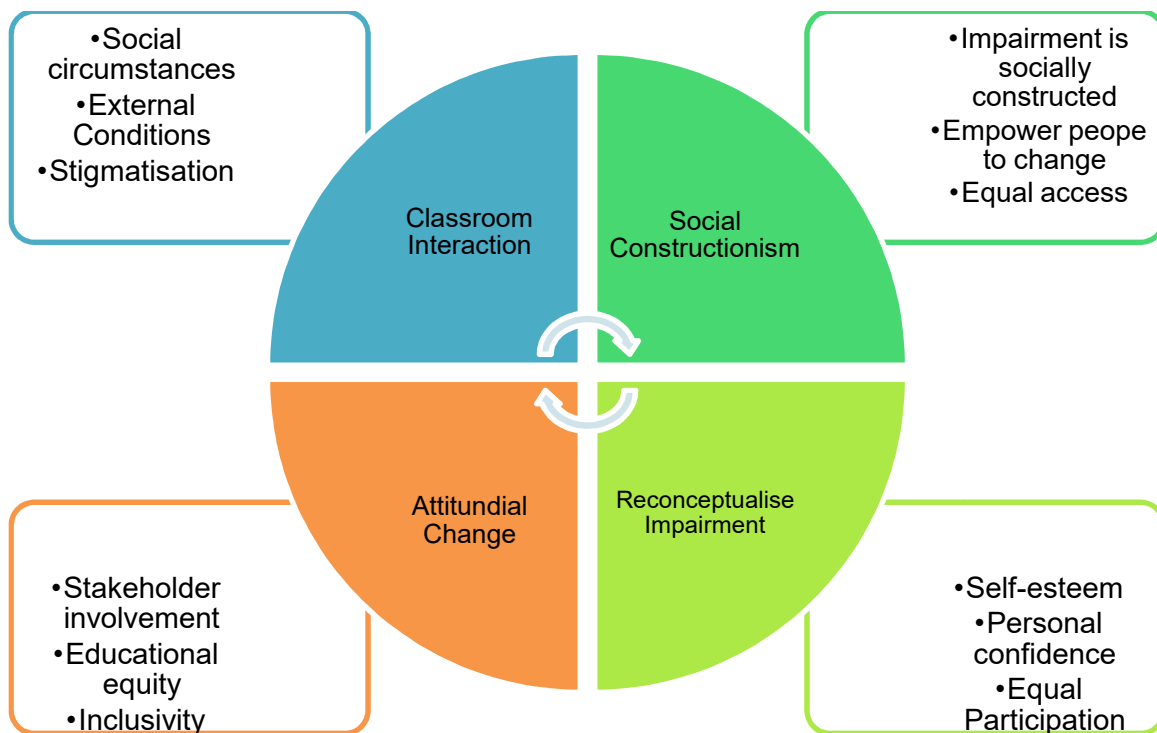


Figure 3.1: The Social Model of Disability(Shava, 2008)

The Social Model Framework explores how the university should change its perceptions to incorporate UDI.

3.4.1.1 Social Constructionism

The Social Model (Oliver, 2013) originated over decades from the personal experiences of the physically impaired and has a close association with self-advocacy and lobbying (Scullion, 2010). The actions of these individuals gave rise to Social Model thinking. Traditionally, the Medical Model of disability has subscribed to the belief that disability is connected to the individual features of a given person and is their tragedy (Zajadacz, 2015). The Social model (Oliver, 2013) relates to Systems Theory (Becvar & Becvar 2014) in that the dysfunction does not lie in the dysfunctional person but in the environment that fails to accommodate PWDs. Therefore, it is a society that has failed this population (Haegele & Hodge, 2016). Similarly, in Systems Theory, the dysfunction does not lie in the dysfunctional person but in the reciprocal relationship of cause and effect that involves both parties, including the relation they interact in ($1 + 1 = 3$) (Singh, 2017).

Appropriate to the South African, situation the Social Model addresses the challenges experienced because of disability, oppression and exclusion (Singh, 2017). The Social Model offered a paradigm shift in the social construction of disability. Haegele and Hodge (2016) applied the Social Model and found that interventions relied heavily on the individual, those who advocate for SWVDs or anyone who positively affects the arrangements between the individual (SWVDs) and the environment (the university). Self-advocacy is also known to affect changes in the environment and their understanding to attain social inclusion (Haegele& Hodge, 2016). Stemming from the foregoing discussion, it can be surmised that the implementation of a universal design system will result in the evolution of a more inclusive university community.

a) Impairment is socially constructed

The current study advocates that disability is imposed when SWVDs are isolated and excluded from full participation in the classroom. This view is supported by Haegele and Hodge (2016) who claimed that isolation and exclusion stem from society's inability and unwillingness, and even neglect, to remove the environmental barriers that SWVDs encounter in their daily interactions within the university environment. Consequently, society believes that SWVDs are less able to participate in the university community. This study is guided by the Social Model in providing an important opportunity to advance the understanding that well-constructed solutions should not be directed at the individual, but at society instead (Haegele & Hodge, 2016).

b) Empower People to Change Current Social Viewpoints

The Social Model of disability could provide opportunities to create an all-inclusive university environment that promotes equal opportunities for all (Shava, 2008). Accordingly, this study draws on the fundamental elements that the Social Model presents on the removal of barriers and its role in increasing the quality of life. Given the Social Model, disability is a form of diversity. This study supports the perspective of Haegele and Hodge (2016) that allowed individuals to accept difference and diversity that may not be familiar or understandable to able-bodied individuals.

c) Equal Access

The study's research questions explored how UDI can promote epistemological access for students with visual disabilities in the classroom. This adheres closely to the view of the Social Model that it is the person's environment and social interaction that denies them access to participate in that community (Zajadacz, 2015). Compliance with the principles of UDI can ensure equal access to educational content and course materials, advancing epistemological access for students with visual disabilities in the classroom. Classrooms should be equipped to accommodate the needs of SWVDs well in advance of their arrival in the lecture halls. This may include Braille notes given by lecturers in classrooms and screen reading software on every computer, allowing SWVDs to choose the most suitable methods or materials. Several studies explored the broader perspective supported by UDI implementation (Singh, 2017; WHO, 2015; Denzin & Lincoln, 2013 & Subrayen, 2011). Universal Design of Instruction provides an opportunity to advance the understanding of problems and challenges concerning knowledge delivery and learning, motivating adequate interventions towards full participation within HEIs. As such, this study explored new avenues towards providing the most suitable foundation for embracing transformation towards greater accessibility and more opportunities for SWVDs.

3.4.1.2 Interaction of SWVDs, Lecturers and other Students in the Classroom

a) Social Circumstances(disabled by society)

Zajadacz (2015) emphasised that it is restrictive factors in the environment (including social and mental barriers) that exacerbated an individual's dysfunction, affecting their full participation in those surroundings. This study outlined the theory stemming from the Social Model that social circumstances and existing social norms, and not the dysfunction of the individual, results in restrictive factors in the environment.

b) External Conditions

The Social Model validates this study's perspective that it is not the SWVDs who need to adapt to the environment, but that social conditions should change to encourage participation in the classroom (Zajadacz, 2015). This study motivates the incorporation of a universal design system by eliminating barriers to education by accommodating SWVDs because when impairment cannot change, external conditions must be adapted to accommodate SWVDs. It is external conditions that impose disability on SWVDs. Therefore, it is a fundamental responsibility of the institution to remove barriers that limit SWVDs to increase their quality of life and create equal opportunities for all (Zajadacz, 2015). The Social Model agrees with the foregoing argument that external conditions impose disability on SWVDs. Theorists asserted that SWVDs are not only "victims" of an inaccessible environment and social neglect but the recipients of an insufficient response to their needs (Haegele & Hodge, 2016; Zajadacz, 2015:pg. 192).

c) Stigmatisation

Educational institutions that exclude oppress and de-value students with visual disabilities from mainstream education, and social activities create attitudinal barriers. This places the discriminatory life experience of SWVDs in the hands of that institution (Scullion, 2010). Invariably, this leads to stigmatisation due to SWVDs being seen only from the perspective of their visual impairment (Scullion, 2010). Zajadacz (2015) asserted that disability has long been rooted in discourses of prejudice borne out of the political struggle against oppression to change one way of thinking over another. This resembles the South African situation. However, Haegele and Hodge (2016) argued that the Social Model has also politicised, empowered and educated SWVDs. Hence it considered disability a form of diversity that proposes a unique perspective that should be valued and celebrated.

3.4.1.3 Attitudinal Change of Lecturers and Other Students

a) Involvement of All Stakeholders

In this study, the Social Model is used to assess ways to change the attitudes and perceptions of the University community to incorporating UDI. This aligned with Haegele and Hodge (2016) who claimed that an educational strategy that applied a proactive design of activities eliminated barriers by accommodating all people as much as possible. This would entail a change in terms of public policy with a focus on the eradication of barriers in the institutional environment (Haegele & Hodge, 2016). This would assist with several problems related to people's attitudes and perceptions about people with disabilities (Haegele & Hodge, 2016).

The Social Model applies a holistic approach similar to Systems Theory (Becvar & Becvar 2014). This implies that the Social Model shares the view that working collaboratively in a system will affect the necessary changes by incorporating the influences of all stakeholders. This would translate to how lecturers perceive and interact with students with disabilities in the classroom, vital for a successful educational experience. Hence, justifying a paradigm shift toward a Social Model perspective motivates educator attitudes and practices to be viewed as social barriers to a universally more accessible system such as UDI (Haegele & Hodge, 2016).

b) Educational Equity

Based on Maslow's (1943/54) Hierarchy of Needs model, those SWVDs who experience educational equity and who are granted the opportunity to participate equally in the classroom will obtain a more quality education. Drawing from the three models: Systems Theory (Bevar & Becvar, 2014), Maslow's Hierarchy of Needs (1943/54) and the Social Model of disability that guides the study a selected approach will be formulated to ascertain the most important aspects of how educational equity and inclusive education for SWVDs and the surrounding university community can be achieved. The study plans to find an amicable solution to incorporate an international model (UDI) that holds the potential to enhance SWVD's academic capabilities. Thus, it will contribute to the inclusiveness of the instructional and learning environment to attain educational equity (Schiemer, 2017).

c) Inclusive Education

Through many centuries, South Africa rose like many before it from the dark ethos of apartheid to a new and welcomed democracy, revealing in its wake the segregation of persons with disabilities (Marimuthu & Cheong 2014). Dalton et al. (2019) affirmed that in 1996 investigation of discriminatory practices in South African (SA) education was revealed due to the apartheid system. It therefore became obligatory to explore more inclusive systems of education. Although PWDs need the training to merge into society, inclusive education also requires a well-designed system equipped with knowledgeable and competent educators to foster the required values, confidence and support for SWVDs (Marimuthu & Cheong 2015). The universal design system is appropriate for meeting this requirement by adequately providing inclusive pedagogy and epistemological access to the higher education curricula. Wells (2022) highlighted that educators who follow UDI principles can re-imagine how learning occurs and is assessed in the classroom. Therefore, developing the knowledge of higher education staff in the design of coursework, assessments, and strategies to support diverse learners at HEIs must become a priority. This would ensure that students with disabilities have equal access to educational opportunities. The Social Model of disability highlights the struggle of persons with disabilities to attain human rights.

3.4.1.4 Re-conceptualise the Experience of Impairment

a) Self-esteem

Fallatah and Syed (2017) described esteem as a need for respect for one's rights; appreciation for one's ability; and the capacity to acknowledge one's achievement. This included the need for the recognition of one's autonomy and independence (Fallatah & Syed, 2017; Maslow, 1943/54). Linked to Maslow's (1943/54) Hierarchy of Needs, self-esteem introduces a new culture that celebrates differences where all people are equally valued and accepted (Marimuthu & Cheong 2015). Based on the Social model of disability (Levitt, 2017), inclusion and participation are vital for human dignity and upholding human rights within a society (Marimuthu & Cheong 2015). Marimuthu and Cheong (2015) declared that transforming ways of thinking at the university is dependent on changing attitudes and instructional methods because inclusion is about accepting diversity. Failure to transform current thinking will impact the basic human rights of SWVDs. This will promote feelings of

inferiority, weakness and discouragement (Marimuthu & Cheong 2015; Green, 2000). This study understands that SWVDs need to feel the self-confident, worthy and capable individuals who are useful and necessary in the world by introducing a universal model of inclusive practice.

b) Personal Confidence

Students with visual disabilities are motivated and keen to satisfy self-esteem needs, which results in self-confidence, morale, feelings of worth and usefulness (Fallatah & Syed 2017; Maslow's 1943/54). Therefore, if SWVDs feel valued and respected, they may feel motivated to improve their capability and achievement of potential (Fallatah & Syed, 2017). Students with visual disabilities who feel successful, accomplished and reputable will feel confident and encouraged to persevere (Fallatah & Syed, 2017). Therefore, by strengthening confidence, it is likely that SWVDs will be motivated to improve academically. A universal design system will contribute toward effective instructional methods and effective teaching and learning, creating an inclusive classroom that provides opportunities for SWVDs to have full interaction with their **able-bodied** peers. Ultimately, enhanced personal confidence will result in SWVDs being motivated enough to achieve more than what is expected of them in the real world (Fallatah & Syed, 2017; **Marimuthu & Cheong, 2014**).

c) Equal Participation in all Aspects of Learning and Disability

In a classroom setting, the Social Model of disability discourse rejects the idea of making rigid curricular decisions (Oliver, 2013). Rather, it embraces educators who attempt to make decisions about the content after interacting with SWVDs (Haegle & Hodge, 2016). This method of changing instruction and adapting coursework, content or activities to accommodate individuals with unique needs subscribes to the Universal Design of Instruction (Haegle & Hodge, 2016). Giving SWVDs equal opportunity to participate in feedback about modifications or accommodations that work best for them in the classroom is a viable approach to educational inclusivity (Haegle & Hodge, 2016).

The researcher's ontological standpoint as discussed earlier (pg. 92) correlates with the Social Model in that it does not believe in fixing individuals but rather changing society. The

researcher is of the impression that reality is evolving and changing and there is a dire need for accommodations within the classroom platform requiring increased levels of understanding to ensure that impairments do not affect one's well-being (Haegele & Hodge, 2016). This relates to Maslow's (1943/54) Hierarchy of Needs model where well-being equates to good health, happiness, esteem, belongingness, security and inclusivity.

This study refers to several studies that applied the Social Model of disability, which includes Singh (2017), Haegele and Hodge (2016) and Kasiram and Subrayen (2013). Other relevant studies that applied the Social Model include Zajadacz (2015) and Scullion (2010). Zajadacz (2015) explored the Social Model in Tourism and Recreation, where she evaluated models of disability that provide the most suitable foundation for any course of action undertaken in the process of planning accessibility within institutions. Scullion (2010) applied the Social Model in a study to explore its influences on nursing and its potential role in challenging discrimination, which also forms part of the current study. As such, incorporating the Social Model of disability at the university is vital to challenge prejudiced views and environmental and social norms that form barriers to learning for SWVDs. In this light, the university should be seen as a part of the solution to the prejudiced views held at both educational and societal levels (Scullion, 2010).

3.4.1.5 Critique of the Social Model

Although legislation demands equal opportunities for PWDs a weakness of this model proposed by Zajadacz (2015: pg. 192) is the “passive treatment” of SWVDs as "victims" of inaccessible surroundings and social exclusion. The Social Model is therefore an insufficient response to their needs. This is supported by Haegele and Hodge (2016), where it was highlighted that the Social Model does not address impairment as a visible attribute of SWVDs that forms an essential part of their lived experience. The Medical Model and the Social Model are mutually exclusive and contradictory (WHO, 2011). A reasonable approach to tackle this issue is to view it neither as solely medical nor as only social. A person's disabilities can be seen as a medical condition that would have existed even if provisions were made by society to enable their involvement in that society.

Haegele and Hodge (2016) argued that disability is something imposed on top of the restrictions that are caused by impairment and pointed to inequalities between those with and without impairments as a socially constructed disability. Zajadacz (2015: pg. 193) debated that not everything is a question of social perspective –"people have bodies and bodies matter". The World Health Organisation (2011) reported that to obtain a balanced approach was to give appropriate weight to the different aspects of disability each model presented. Both medical and social responses are appropriate to the problems associated with disability, creating a consistent overview of pathways with common elements, without the discrepancies each makes in reducing the whole (Zajadacz, 2015; Massa & Lauritzen 2010). This parallels with Systems Theory and a similar stance applied with this proposed model for analysis selected for this study.

Whereas the Medical Model favours discriminatory thinking and practice, adopting the Social Model in education and research is an ideal strategy to challenge discrimination in South African educational institutions (Scullion, 2010). Scullion (2010:pg.704) asserts that "disability" is predominantly seen as a medicalised concept and universally implies low social status, thus associated with the denial of human rights. It is for this reason that the current study takes on the paradigm shift that the Social Model represents and rejects the idea that disability be viewed from the perspective of the Medical Model. Accordingly, this study draws on the fundamental elements that the Social Model presents on the removal of barriers and its role in increasing the quality of life for SWVDs.

The concepts of the Social Model (Oliver, 2013) that relate to concepts of the other 3 models applied in the study will be highlighted and comparisons will be accordingly drawn to emphasize the similarities. In so doing, it will substantiate the combined use of the selected models for the study.

3.4.2 Maslow's Hierarchy of Needs Model

Aspects of Abraham Maslow's (1943/1954) Hierarchy of Needs Model contained relevance to the current study. Since not much research on disability studies included Maslow's Hierarchy of Needs, this study found it appropriate as it provided a framework for changing the traditions and exploring SWVDs comprehensively (McLeod, 2014). This study also builds on the findings of a master's research study at UKZN (Singh, 2017) which proposed an

adaptation of Maslow's (1943/54) Hierarchy of Needs model from a theoretical perspective. This study favours the amendment that motivates the incorporation of inclusivity as an additional aspect of motivation at the third level of the hierarchy. Maslow's original five-level Hierarchy of Needs model is a classic representation of human motivation. However, the adaptation explained by Singh (2017) emphasised the relevance of "inclusivity" at the 3rd level (Belongingness and Love needs) as a motivator in achieving academic success (as illustrated in Figure 3.1).

Maslow's (1943) Hierarchy of Needs model includes five motivational needs, referred to as hierarchical levels that form a pyramid (McLeod, 2014). This model revealed the following key elements that were found applicable:

- Maslow did not equate self-actualisation with perfection. Rather, he focused on achieving one's potential;
- He focused on positive accounts of human behaviour - What goes right in a person's life?
- Maslow's hierarchy demonstrated experimentally more comprehensive care for the whole person (Jackson et al., 2014);
- Maslow defined self-actualisation as a desire to become more of what one is rather than becoming everything that one is capable of becoming (Green, 2000);
- Unmet needs influenced goal-seeking behaviours; and
- Commitment to achieve SWVDs educational goals (McLeod, 2014).

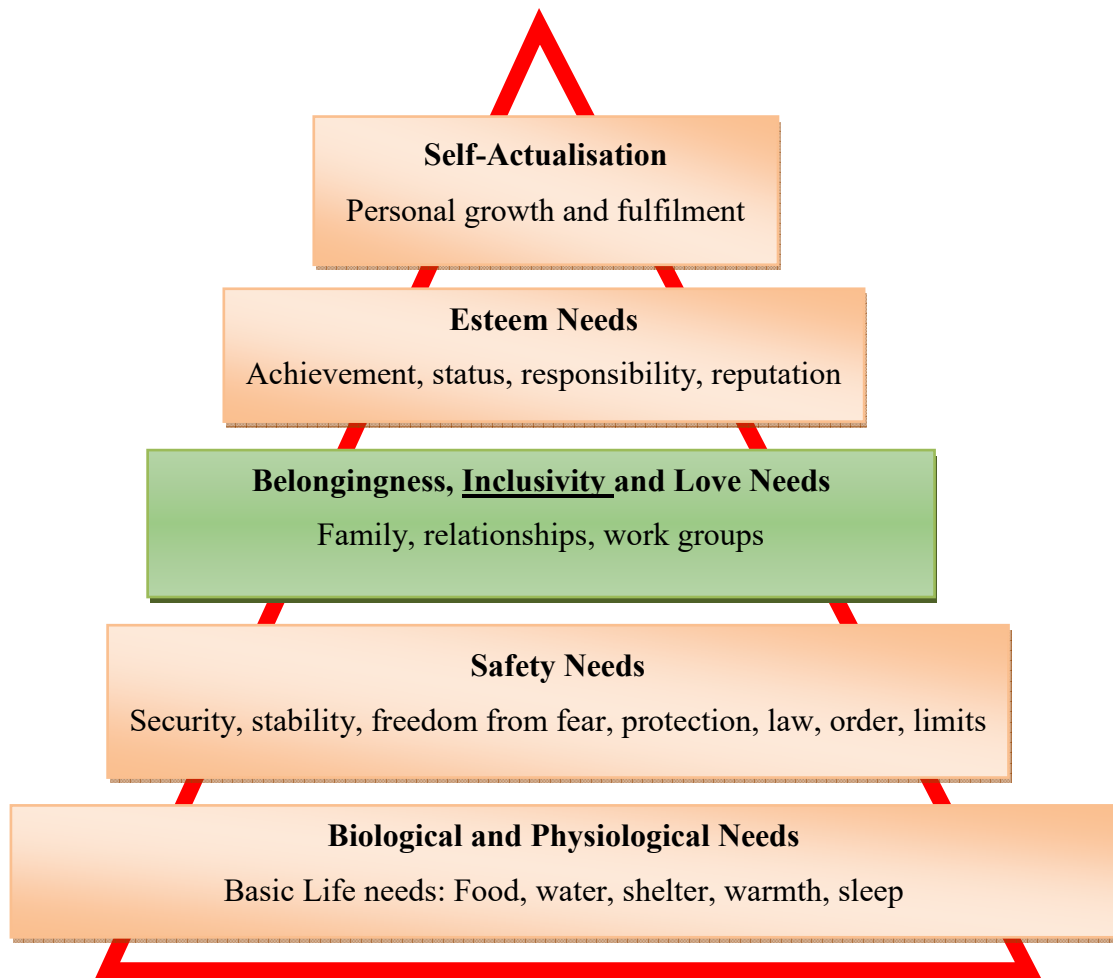


Figure 3. 1: The Adaptation of Maslow's Hierarchy of Needs Introducing "Inclusivity" at the 3rd Level(Singh, 2017)

Rahman (2019) revealed that students placed in integrated educational institutions performed significantly better than their counterparts in segregated institutions. Inclusive educational institutions help to remove inferiority complexes amongst SWVDs and provide a sense of belonging, love and respect for SWVDs among other students (Maslow). Furthermore, Maslow employs the concept of motivation where it highlights that when learning environments are conducive to learning, they get help from peers for learning and in this way become motivated for learning. Universities that have successfully integrated SWVDs can ensure social integration by providing the opportunity for full participation. Students can thus enjoy life without fear and anxiety, improving their self-concept.

Maslow's Hierarchy of Needs Model examined the applicability of UDI in promoting a sense of belonging and inclusivity in the following ways:

3.4.2.2 Self-actualisation

McLeod (2014) described the arrangement of the basic human needs in Maslow's model to be in a hierarchy of relative pre-potency. This meant that when a particular need is satisfied, discontent and restlessness develop and that person is then compelled to seek the fulfilment of the next need (Green, 2000). Self-actualisation is the desire for self-fulfilment, to become aware of what one potentially is. Green (2000: n.p) expressed it as: "What a man *can* be, he *must* be".

This study explores the principles of UDI which motivate the implementation of a curriculum design that targets the individual needs of SWVDs. This places SWVDs in a position to be in control of their learning journey, improving academically with enhanced self-confidence in learning and life (Dutta, 2013).

a) Achieving One's Academic Potential

The ontological premise of the study is consistent with Maslow's belief that a person is always "becoming" and never remains static (McLeod, 2014). The world is constantly "in the making" where all stakeholders contribute collaboratively (Vianna & Stetsenko, 2014: pg 582). By implication, the world does not exist independently but operates reciprocally with all human beings who have unlimited potential and are equal regardless of their uniqueness and diversities (Vianna & Stetsenko, 2014). This is supported by Systems Theory (Becvar & Becvar 2014), another framework applied in the study showing relevance to the importance of a reciprocal and collaborative approach to servicing SWVDs. McLeod (2014) iterates that Maslow related self-actualisation with the achievement of one's potential through the desire for fulfilment and change through personal growth. Therefore, several studies agreed that UDI could facilitate access to the required tools within the learning environment to help SWVDs achieve their academic potential (McLeod, 2014; Vianna & Stetsenko, 2014).

b) Academic Accomplishment

An accomplished individual will consistently seek fulfilment and change through personal growth. Similarly once SWVDs can satisfy basic self-esteem needs, it drives them to reach

for quality education and become academically accomplished. This enables SWVDs “to pursue self-actualisation or to be all that one can be” (Benson & Dundis, 2003, pg. 316).

3.4.2.3 Esteem Confidence in Abilities

Self –esteem is diminished due to a lack of involvement which usually occurs when decisions, ideas, contributions and concerns raised by SWVDs are ignored or not attended to (Benson & Dundis 2003). Therefore, it is vital that the voices of SWVDs are heard because failure to do so will result in SWVDS feeling misunderstood and unappreciated, which is known to reduce their self-esteem. Another esteem issue involves SWVDs’ need to be educated on how to use assistive technology as a failure to keep up with technology can cause self-esteem problems. A system such as UDI will enhance the equal participation of SWVDs in the classroom, which will fulfil esteem needs and thereby encourage SWVDs to aspire to achieve academically. Green (2000) confirmed that by satisfying self-esteem needs SWVDs will develop self-confidence, worth, strength and capability, resulting in feelings of adequacy that their lives are valued in the world.

a) Achievement and Success Fulfil Esteem Needs as SWVDs Gain Respect and Recognition from Others

There is a great need for SWVDs to feel a sense of belonging within a particular community. In this instance, a positive association between SWVDs within the university community plays a vital role in improving self-esteem through feelings of self-worth, acceptance and respect (Zalenski & Raspa, 2006). Zalenski and Raspa (2006) explained that feelings of self-worth and gaining respect and recognition from others with similar values grows confidence levels and develops self-esteem. When the self-confidence of SWVDs is enhanced, it will lead to greater opportunity to obtain rewards, recognition and to perform well academically (Benson & Dundis, 2003). The implementation of UDI is necessary to merge SWVDS into the classroom with able-bodied students, encouraging reciprocity that forms mutually beneficial relationships (Godden & Hsy, 2015). Thus, promoting feelings of acceptance, belongingness and recognition creates a wealth of opportunities to learn, participate and express knowledge (Rahman, 2019).

3.4.2.4 Belonging and Motivation

The need to belong within a University community is vital for successful inclusion and involvement in preventing the isolation and withdrawal felt by SWVDs (Benson & Dundis, 2003). Maslow's Hierarchy of Needs model (1943/54) provided an understanding of the needs of individuals that can enhance feelings of belonging and self-esteem and provide opportunities to self-actualise. The satisfaction of the need to belong shifts the needs of SWVDs to the need to feel competent, confident and self-assured (Benson & Dundis, 2003). As a result, satisfying students' need for belonging creates a supportive environment in the classroom that enhances academic progress (McLeod, 2014). Zalenski and Raspa (2006) validate Maslow's approach as a theoretical framework that supports the design of interventions such as UDI, capable of helping SWVDs develop their potential at the end of life.

a) Academic Achievement

Maslow approached education and learning holistically when he viewed how the physical, social, emotional and intellectual qualities of SWVDs influenced learning (McLeod, 2014). This study embraced this comprehensive reach that the hierarchy employs (Zalenski & Raspa, 2006). Maslow believed that before cognitive needs are met, basic physiological needs must be fulfilled. In other words, a hungry student will find it difficult to concentrate in the classroom (McLeod, 2014). All students will first need to feel emotionally and physically safe and accepted within the classroom to progress to their full potential. Therefore, to achieve academically, SWVDs need to feel valued and respected in the classroom and the method of instruction should be supportive and inclusive (McLeod, 2014). To achieve this requires changes in the institutional environment and paradigm shifts in the current education system (Subrayen, 2011).

b) Equal Opportunity

Haegele and Hodge (2016) affirmed that giving SWVDs equal opportunities to participate in providing feedback promoted educational inclusivity. An all-inclusive educational environment guarantees the effective participation of each learner in learning, which will facilitate the process of knowledge production within the institution (Subrayen, 2011).

Universal Design of Instruction improves the university's capacity to respond to a greater diversity of learning needs. Such a system exposes lecturers and students without disabilities to a greater diversity of learner needs, encouraging the acceptance of new ways of teaching and learning, tolerance for diversity and equalization of opportunities (Subrayen, 2011). Hewett et al. (2018) proclaimed inclusive and accessible HE to be an exciting prospect and one that UDI speaks directly to. This view is supported by Marimuthu and Cheong (2015) who consider inclusion to mean celebrating differences. Inclusion and participation are necessary for human dignity and the appreciation of human rights within a society (Marimuthu & Cheong, 2015).

c) Inclusivity

It was emphasised in Ntombela (2013) that inclusive education is fundamental to the development of both individuals and societies. Inclusive education should not be solely about the removal of barriers and the creation of responsive environments of learning but also seen as a right for all, irrespective of individual differences (Ntombela, 2013). Madriaga et al. (2010) concurred that it should be about enhancing the student learning experience and providing quality education for all. However, how to change entrenched attitudes remains a challenge as people expect those with disabilities to fit into the university community without reciprocal adjustment (Ntombela, 2014). Maslow argued that motivating individuals required approaching **individuals** as an integrated and organic whole (Zalenski & Raspa, 2006). The integration of the diversity of SWVDs within the university must include the integration of "ultimate human needs and goals appropriate to humanity's full range of being" (Zalenski & Raspa, 2006: pg. 1121). Two studies supported the theory that all students will benefit from an inclusive practice agenda such as the UDI system designed to support a holistic approach to education and learning (McLoed, 2014; Madriaga et al., 2010). As a result, this study motivates that inclusivity is necessary on the 3rd level of Maslow's Hierarchy of Needs, along with belonging and love proposed in the study by Singh (2017) (refer to the adaptation in Figure 3.1).

d) Participate Equally in the Classroom

Blind people deserve equal opportunity and equitable access to resources so that they too may be able to reach their greatest dream, which is to fully participate in this society. This was supported by Zalenski and Raspa (2006) who claimed that human beings develop once successfully merged into communal traditions. As such, inclusion and respect from the university community amongst mainstream students who share similar values will lead to higher self-esteem (Zalenski & Raspa, 2006). This implies that SWVDs who participate **equally in** every domain of university life will fulfil esteem needs and aspire to achieve their desired educational outcomes (Zalenski & Raspa, 2006).

3.4.2.5 Basic Need Satisfaction

It was argued by Alkire (2010) that human development was not only concerned with basic need satisfaction but also required the full participation of individuals. Human development is a "participatory and dynamic process" that required progressive and mutual support that involved both the effort of the SWVDs and the system of support at the university (Alkire, 2010, p.5).

a) Quality Education

Maslow argued that despite the multitude of conscious desires, all students have similar desires such as to achieve academically (Zalenski & Raspa, 2006). Therefore, many barriers to accessibility can be overcome through awareness of design issues (Pearson & Koppi 2002). The implementation of UDI for instance motivates the design of accessible coursework incorporating design strategies that will enable SWVDs to take advantage of the quality education they deserve (Pearson & Koppi, 2002). A universal system such as UDI provides an educational design that is accessible, flexible and informative, not specific to SWVDs but a better educational experience for all students.

b) A Sense of Autonomy and Independence

Ntombela (2013) expressed that it is common knowledge that accommodations uphold the dignity of those with disabilities. However, it was evident in Ntombela's (2013) narrative of a SWVD's lived experience that the university did not prioritise physical access, leading to SWVDs feeling frustrated with the current system. Ntombela (2013) proved that in trying to assist SWVDs the university community failed to realise that their approach is far more damaging than helpful because SWVDs want to be independent like others, rather than be held prisoners by their hostile environments. The study therefore motivates a system that incorporates the principles of UDI that undertake to provide all the adjustments necessary to uphold the dignity of those with disabilities, giving them a sense of autonomy and independence.

Hewett et al. (2018) argued that a balanced approach was necessary where accommodations and adjustments were considered in conjunction with individual needs to enable SWVDs to function as independent learners. The learner is required to acknowledge what will facilitate a successful outcome by also drawing on their personal agency. To embrace inclusive practice SWVDs need to build on what they have learnt during their life to take full advantage of the models of support offered at HEIs (Hewett et al., 2018). It is essential that SWVDs work in partnering with HEIs to develop strategies of support to ensure they are progressive (Hewett et al., 2018). However, Benson and Dundis (2003) argued that it is important that HEIs understand the challenges according to the universal needs and driving forces of individuals. Advanced educational systems like UDI are therefore necessary to provide opportunities to meet those needs known to improve motivation, confidence, self-efficacy and commitment, leading to greater student retention and throughput.

3.4.2.6 Critique of Maslow's Model

Although there is a great deal of acknowledgement and acceptance of Maslow's Hierarchy of Needs, it has received some criticism. A major critique of Maslow's Model highlighted in Fallatah and Syed (2017) concerns the principle of motivation as there is limited empirical evidence of the universality of Maslow's model. It was emphasised that satisfaction is considered relative from person to person and context to context. Furthermore, a majority of the empirical studies on Maslow were undertaken in western organisations and contexts. As a

result, this study is appropriate as it addresses this gap by paying close attention to the interactions of a diverse body of students within HEIs located in a developing country like South Africa (Fallatah & Syed, 2017).

3.4.2.7 The Application of Maslow's Model in Other Studies

This study found it appropriate to apply Maslow's Hierarchy of needs as it provided a framework for understanding SWVDs more comprehensively (McLeod, 2014). Not much literature on disability studies incorporated Maslow's Hierarchy of Needs. However, discussions by Jackson et al. (2014); McLeod (2014); Zalenski and Raspa (2006); Benson and Dundis (2003) and Green (2000) motivated its application in the current study.

Several authors applied Maslow's Hierarchical Model in a variety of other settings as it provides a comprehensive overview of the whole person, including all aspects of body, mind and spirit.

Previously, Green (2000) believed that it was crucial to transform current thinking as it infringed on the basic human rights of SWVDs. As a result, it gave rise to feelings of inferiority, weakness and discouragement that hindered the need to become actualized and achieve maximum human potential (Green, 2000). Benson and Dundis (2003) explored Maslow's Hierarchy of Needs in training and technology to understand the motivation of employees. Benson and Dundis (2003) discovered new opportunities for learning and self-definition that this study found appropriate as it focused on understanding challenges according to universal individual needs, resulting in SWVDs feeling secure, needed and appreciated. Furthermore, it enhanced a sense of belonging and self-esteem, providing opportunities for self-actualisation. Consequently, universities that have successfully incorporated SWVDs by providing the opportunity for full participation can ensure successful inclusion in society.

In recent studies, Jackson et al. (2014) and McLeod (2014) applied the principle of Maslow's Hierarchy of Needs in scientific fields such as business and social sciences to introduce a culture of change. Jackson et al. (2014) adopted Maslow's theory in determining care plans and acknowledging patient concerns. This relates to the current study that endeavours to promote the acknowledgement of SWVDs concerns in a mainstream university setting. The

perspectives provided by Maslow offered a powerful conceptual framework to understand the inclusivity of SWVDs' through their lens to tailor optimal intervention strategies. Thus, it draws similarities with the current study that explores the implementation of a universal design system to incorporate new opportunities for learning that inculcate a sense of belonging.

Along similar lines, Zalenski and Raspa (2006) adopted Maslow's Hierarchy of Needs to standard hospice and palliative care medicine in order to achieve maximum human potential through the benefit of the hierarchy's comprehensive reach. Comprehensive care involved cognitive, psychological and physical aspects of individuals, including emotional fears, acceptance and respect, relating to key attributes of the current study.

The study by master's student Singh (2017) applied Maslow's beliefs to a study involving the integration of SWDs within a mainstream university setting. Singh (2017) applied Maslow's model in conjunction with the Social Model of disability and Systems theory. These models proved to overlap in terms of comprehensive reach, a holistic approach to disability and focused on reciprocal relationships that understand problems to be the symptoms of systemic dysfunction and not a dysfunction centred on the SWVDs.

3.4.3 Systems Theory

Systems theory originated with Ludwig von Bertalanffy in 1950, who explained that discoveries and contradictions are understood by way of applying universal concepts to all types of grouping of phenomena, known as systems (Smith-Acuña, 2011). Smith-Acuña (2011) explained that according to Von Bertalanffy, a system is a set of elements in interaction. The Systems Theory framework was found to be fitting in this study as it involved the collaboration of services in support of inclusivity within a system such as the UKZN with its various Colleges and Departments. Systems Theory embraced a holistic philosophy that included all stakeholders within the university community to better support SWVDs. Table 3.2 outlines the selected principles of the Second-Order Cybernetic Epistemology of Systems Theory that was selected to underpin the study.

Systems Theory:Principles of the First and Second-Order Cybernetic Epistemology		
First Order Cybernetics	Second Order Cybernetic Approach applied in the study	
Recursion	1. Relationships between SWVDs, and other students and lecturer in the classroom	
Feedback		
Morphostasis	2. Holistic approach	
Morphogenesis	- Working collaboratively in a system	
Rules and Boundaries	- Connectedness to all aspects of learning in the classroom.	
Openness and Closedness		
Equifinality	3. Reciprocity (give-and-take actions),	
Equipotentiality	- Inclusivity	
Communication and Information processing	- Holistic philosophy	
	- Academic support	
	- Interdependency,	
Relationship and Wholeness	4. Shared responsibility	
Goals and Purpose	- Social interaction of SWVD, Lecturers and other students in the classroom	
Wholeness	- Participation of SWVDs in all aspects of learning in the classroom.	
	- Working collaboratively	

Table 3. 2: Systems Theory-Principles of the First and Second-Order Cybernetic Epistemology

3.4.3.2 Relationships betweenSWVDs and Other Students and Lecturers in the Classroom

Working collaboratively requires synergy between all stakeholders within the university community. Similar to the Social Model that premises the fact that impairment is socially constructed, Systems Theory's approach to SWVDs will involve examining the dynamics that can drive and accelerate the course of development by examining the synergistic influence of

the characteristics of the person and of the community they interact with (Llewellyn & Hogan, 2000).

3.4.3.3 Reciprocity (give-and-take actions)

The Systems Theory framework is operating based on understanding the reality through recursiveness or reciprocal causality and feedback or self-correction (Becvar&Becvar, 2014). Previously cause and effect were considered linear. However, according to Systems theory causality is reciprocal and based on the give-and-take actions of all participants in the system. A student with visual disabilities cannot be viewed in isolation as each person in a relationship interacts with and influences the other and therefore exist in a "conjoined universe" (Becvar&Becvar2014:pg. 70). Universal Design of Instruction encourages reciprocity between user and designer where it is necessary to work with SWVDs to meet their needs (Godden &Hsy, 2015). Furthermore, the SWVDs and individuals in the university community are bilaterally responsible to sustain an all-inclusive environment (Becvar&Becvar, 2014). This relates to Hewett et al. (2018), who emphasized the significant role of the individual learner in helping to shape his or her experiences within HEIs by drawing on one's personal agency. Personal agency includes drawing on the student's own ability to embrace inclusive practice, highlighting the importance of preparing SWVDs for new environments such as UDI by promoting independence skills.

a) Inclusivity

Systems Theory encourages universities to embrace a holistic philosophy of inclusion that embraces supports and trains all staff and academics to better support SWVDs. As such, UDI implementation is a means toward improving inclusive education in South Africa as it encourages flexibility in the teaching and learning methods of presentation, expression and engagement (Dalton et al., 2012). Furthermore, teachers need new skills, training and support from an educational system such as UDI that aligns with Systems Theory in finding ways to plan and work collaboratively for the greatest benefit of their learners (Dalton et al., 2012).

b) Holistic Philosophy

The common thread in this study is that all stakeholders (DSU staff, lecturers, librarians, technicians, students, the voices of SWVDs, their personal agency and ability to advocate and the researcher's epistemological standpoint) impact the inclusivity of the entire system. All stakeholders within a university community must identify and acknowledge that each person is a small part of that whole system.

c) Academic Support

Based on the principles of Systems Theory, two individuals are not independent as they mutually influence each other in a system (Becvar & Becvar 2014). Therefore, perceptions of all stakeholders have a significant influence on the academic support system that SWVDs receive. People may differ in their role and relationship towards SWVDs in different contexts within mainstream HEIs, which may include teachers, parents, peers, staff members, supervisors, trained researchers and the self-perception of the SWVDs themselves. Therefore, the university must strike a balance by providing mutually beneficial accommodations to facilitate learning environments that enable SWVDs to become independent learners (Hewett et al., 2018). While the university benefits from having an accommodating environment that facilitates learning, SWVDs gain as independent learners.

d) Interdependency

Interdependence is an important determinant of how the university system responds to change. It is not possible to work with SWVDs in isolation because the university system is based on the interrelatedness of all stakeholders. Similar to a ripple effect, a change in any one aspect reverberates through the entire institution (Becvar & Becvar, 2014). Stemming from the foregoing discussion, the Systems Theory framework emphasises the significance of mutually beneficial accommodations between the learner and the HE environment. The implementation of UDI may be used as a strategy for raising academic standards for all learners. However, providing such a universal system of support requires that the learner is suitably resourced through their earlier educational experiences to be able to participate in the

new HE setting. Hewett et al. (2018) proclaimed that this interdependence between SWVDs and the university requires that:

- Learners are empowered to develop personal agency by coming to university with the necessary skills and experience to benefit from the inclusive HE environment;
- Learners work in partnership with the HEI to ensure the practice is inclusive; and
- Learners partner with HEIs to develop inclusive support strategies that form progressive mutual accommodations.

Hewett et al. (2018) asserted that interdependence required a balanced interactional model of support to improve inclusive practices at HEIs. The implementation of a UDI system will ensure that the university finds an appropriate balance by improving learning experiences, taking on the responsibility of developing and promoting inclusive practice, making adjustments to suit individual needs and recognising the personal agency of the SWVDs (Hewett et al., 2018).

3.4.3.4 Holistic approach

a) Working Collaboratively in a System

A master's thesis on disability studies by UKZN student Singh (2017) conferred that when accessibility and inclusion are acknowledged and considered collectively, it will improve awareness. As such, an approach that adopts operating in the collaboration of services to provide a university that takes advantage of attributes, which include being academically centred and prioritising student needs, will offer instructional methods and knowledge acquisition in an environment that is well-established to support inclusivity Raab & Adam, 2005).

All participants in the educational environment mutually influence one another and are important participants who need to work collaboratively at multiple levels from different areas of the campus (Becvar & Becvar, 2014). This includes employing both top-down and bottom-up collaborative efforts of relevant university staff that will enable the university community to prioritise access to information by SWVDs (UKZN Policy, 2004). This was

supported in Storrie et al.(2010) where the essential driver for the provision of support for SWVDs was executive groups and senior managers working in partnership with lecturers, tutors and learning support programs to set the culture for being inclusive.

b) Connectedness to All Aspects of Learning in the Classroom

Fostering connectedness to all aspects of learning in the classroom requires the active participation of all stakeholders to optimise the educational experience of SWVDs. Becvar and Becvar (2014) explained that the relevant individuals in the relationship plus their interaction make up the whole. On logical grounds, the whole is distinctly different from the sum of or contributions of the individual members or parts of a system. The foregoing argument leads to the fundamental concept of Systems Theory in that the "whole is greater than the sum of the parts" Becvar and Becvar (2014:pg. 77). In this instance, it concerns all stakeholders within the university community because individuals cannot be considered in isolation as perspectives are relational and the focus is on the context or the whole (Becvar & Becvar, 2014).

Diagram showing the fundamental principle of Systems Theory

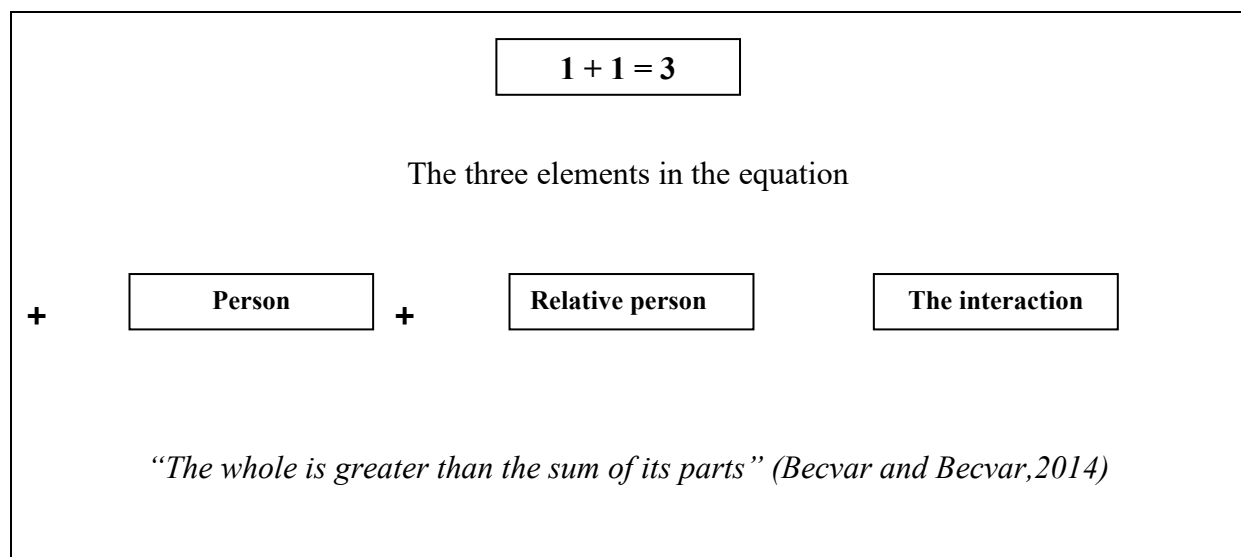


Figure 3. 2: The Fundamental Principle of Systems Theory (Becvar & Becvar, 2014)

It follows that to understand the university system requires looking at it in its entirety and not at individual aspects or members. The observer is part of the observed given that what is observed reflects as much about the observer as it does the observation. The epistemological standpoint of the researcher is advocating for educational inclusivity for SWVDs. The interaction of the researcher and participants are collaborative change agents who are not passive observers or interpreters of reality (Vianna & Stetsenko, 2014). The ensuing discussion clarifies that wholeness reflects both the internal structure of the system and the mutual connectedness between all participants

3.4.3.5 Shared Responsibility

a) Social Interaction of SWVDs, Lecturers and Other Students in the Classroom

Concerning the stone in a pond ripple effect mentioned earlier, it becomes possible to effect change in individuals like SWVDs to facilitate change in the entire institution, and to become inclusive as a whole. Students with visual disabilities, lecturers and other students in the classroom are challenged in the face of change. For instance, the shift to a universal design system may be difficult for all to adapt to. However, like rippled waters will always return to the previous state of calm, the university community will return to its previous state of stability once UDI is implemented to reveal a new paradigm with an inclusive focus that benefits all in the system. In the case of a long-standing problem of exclusionary practices, all stakeholders of the university community are impacted. Therefore, treating the problem in isolation does not constitute a systemic or cybernetic approach and fails to understand that problems are the symptoms of a systemic dysfunction (Becvar & Becvar, 2014).

b) Participation of SWVDs in all Aspects of Learning in the Classroom

People understand difference based on their frame of reference and reality is based on this epistemological premise (Becvar & Becvar, 2014). As such, one cannot truly know what SWVDs go through because the truth exists as one chooses to understand it. Therefore, it is imperative that SWVDs are equal participants in decision-making and designing for all

aspects of learning in the classroom, based on the viewpoints expressed on their lived experiences.

3.4.3.6 Critique of Systems Theory

The point of view shared by Family and Feminist Therapy indicates the failure of Systems Theory to consider the larger social context within which people live and showed concern that it was reflective of the dominant white patriarchal culture (Becvar & Becvar, 2014). Hammond (2012) supported the insinuation that the Systems approaches were the ideology of the technocratic elites. This study contests this notion as it applies the "unity in diversity" concept, embracing the Social Model of human interaction in a diverse university community.

A study carried out by the researcher revealed that systematic theories used in the educational sector have many benefits to the diverse populations within institutional environments (Singh, 2017). Systems Theory involves interdependency, adaptability and the exchange of resources and energy between different systems (Marri, 2015). In Systems Theory, there is an emphasis on removing obstacles in the system. This includes:

- Institutional discrimination;
- Focus on inclusion rather than separation;
- It shows connectedness to all living things; and
- It is based on a philosophy that "compassion towards others is compassion towards self", which is extremely valuable to people experiencing depression, isolation, anger and self-worth issues, as in the case of SWVDs at university (Marri, 2015: np.).

Amidst such positive attributes, systems theorists have reflected on some possible limitations. It has been argued by Marri (2015) that the limitations of Systems Theory lie in the fact that this theory only agrees with changes that stabilise the system. Furthermore, this can pose a problem when presented with issues such as racism, the poor and PWDs. Marri (2015) emphasised that macro systems benefit from having certain populations remain where they are. As a result, abrupt changes in people's rights, opportunities and privileges threaten the system and disrupt the balance. This implied that with Systems Theory, change was slow and

steady. The current study favours promoting a gradual change as part of the long-term goals of the university to provide universalism that ultimately benefits all.

When traditional educational methods are replaced by the implementation of the new UDI system, the experience is expected to be that of a "Gestalt switch" (the picture depicting a young woman where previously it was perceived as an old woman) (Becvar & Becvar, 2014:pg. 30).



Figure 3. 3: The Gestalt Switch Illustration (Donaldson, 2017)

Systems Theory is a paradigm shift that focuses on relationships between individuals and directs attention away from individuals and problems viewed in isolation (Becvar & Becvar, 2014). The UDI paradigm should be accepted and viewed as an enhancement of the current situation at the institution.

3.4.3.7 Application of Systems Theory in Other Studies

Seligman and Darling (2007) applied the systems approach to theoretical and treatment aspects of families because disability or chronic illness affected all family members. In this study, disability is explored within a university context that involves all stakeholders interacting collaboratively. As such, Seligman and Darling (2007) motivated the effectiveness of Systems Theory for the current study.

Previously, Gray, Duhl and Rizzo (1969) applied the Systemic/Cybernetic paradigm and focused on context and the importance of communication. Gray et al. (1969) believed that according to Systems Theory, the context should be understood from the individual's perspective. Similarly, previous research studies such as Hoffman's (1991) and Auerswald's (1985) applied the Systems Theory framework in conjunction with the Social Model that shares core constructs focused on problems in interactive relationships as opposed to the individual, and upheld the idea that reality is socially constructed.

Hoffman (1991) predicted a shift to Systems Theory in future approaches to family therapy. As such, this study was guided by Hoffman's (1991: pg. 393) Cybernetic Epistemology that embodied the following characteristics:

- The observing stance included the observer/researcher context;
- A collaborative structure;
- Setting a context for change (UDI implementation);
- Stay guarded against instrumentality;
- Circular rather than linear cause-and-effect in the assessment of the problem; and
- Uphold a non-judgmental view.

In experimenting with ways of responding to families in distress, Auerswald (1985) applied Systems Theory to transform the family system by exploring the event shape in time-space in an ecosystem expansive enough to see the problem in context. This study concurred with Auerswald (1985), who claimed that the only way to transform a situation is to transform the family. This study identified that the only way to transform an inaccessible university system to accept a diversity of SWVDs is to transform the university as a whole by the implementation of a new universal design system, seen as an improvement over the existing system (Becvar&Becvar, 2014)

Recent theorists such as Goldenberg and Goldenberg (2013) applied Systems Theory in Psychotherapy, identifying the patient's symptoms as rooted in the dysfunctional family. Similarly, this study identified symptomatic dysfunctions rooted in an inflexible system as a whole. All stakeholders within a university community are equally symptomatic despite efforts to locate the problem within individual SWVDs. Storrie et al. (2010) conducted another study that embraced Systems Theory's holistic philosophy of inclusion that supported

the contention that no single set of factors is responsible for the successful inclusion of SWVDs, rather it required a comprehensive outlook of the entire system.

3.4.4 The Capability Approach

The Capability Approach was introduced by Amartya Sen in the 1980's and advanced by Martha Nussbaum, and focused on equality and developing human potential (Broderick, 2018). This study focuses on Sen's approach, founded on enhancing individual freedom and Nussbaum's theory, founded on respecting human dignity (Wells, 2019). In addition, the study explored Alkire (2010) who agreed that the Capability Approach was a moral framework that can be used as a tool to overcome the limitations of the traditional equality assessments of education. Alkire (2010) believed that human development stemmed from widening people's choices and the level of their achievements that led to their well-being, which related to Maslow's (1943/54) Hierarchy of Needs model. Furthermore, the main objective of human development was to expand capabilities. This study proposes to enhance capabilities by introducing UDI and embracing Alkire's (2010) view that human development was not only concerned with basic need satisfaction, but also with human development as a "participatory and dynamic process" (Alkire, 2010: p.5). The capability approach is appropriate in this study as it promoted human diversity and allowed for human flourishing (Broderick, 2018).

3.4.4.2 Enhancing Individual Freedom

a) Respecting Human Dignity

The Capability Approach applies to disability studies as it acknowledges that society comprises individuals with unequal abilities and needs. However, according to the UNCRPD, "discrimination against any person based on disability is a violation of the dignity and worth of the human person". Broderick (2018) therefore advocated that all social structures should respond to human diversity. This includes respect for the dignity of SWVDs within an educational sphere and individual autonomy, including the freedom to make one's own choices, all of which are part of human diversity. Article 24 of the UNCRPD prioritised

accessible educational systems that are eligible to meet the needs and capabilities of SWVDs. Thus, the current study introduced UDI to overcome the deprivation caused by barriers in the environment as SWVDs need to “be treated as dignified beings whose worth is equal to that of others” (Broderick 2018: pg. 31). In addition, SWVDs must feel self-confident and as capable individuals necessary in society.

Marimuthu and Cheong (2015) affirmed that inclusion and participation are necessary for human dignity and the appreciation of human rights within a society. As such, this study motivates the re-designing and restructuring of existing systems to align with the principles of UDI to meet the demands of a diverse student population. Schiemer (2017) declared that education is a capability in itself. Therefore, Marimuthu and Cheong (2015) suggested that universal design systems required greater commitment from professionals to prioritise such inclusive educational designs for implementation.

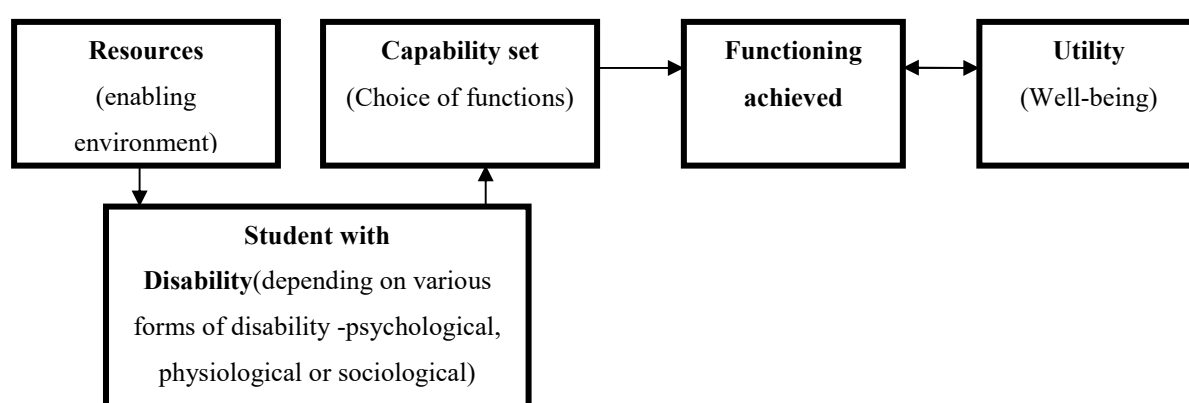


Figure 3.4: Functioning and Capability of Students with Visual Disabilities (Schiemer, 2017)

b) Functionings

Functionings are states of 'being and doing' such as being well-nourished, having shelter and education. In accordance with Systems Theory, Schiemer (2017) believed that the most important aspects in working towards educational equity and inclusive education were the involvement of all stakeholders within a university community. In using the capability of education, SWVDs can achieve the function of being valued and contributing members of their society. In other words, experiencing educational equity and being granted the

opportunity to participate equally in society leads to improved quality of life, which is central to the Capability Approach (Schiemer, 2017).

c) Capability

Capability refers to the set of valuable functionings that a person has effective access to. Based on Schiemer's (2017) explanation, the Capability Approach looks at capabilities which already exist in SWVDs and which can lead to certain functioning, provided that the circumstances or the university environment enable SWVDs to use those capabilities and turn them into functions or actions.

Dubois and Trani (2009: pg 198) quoted Martha Nussbaum's "10 central capabilities that constitute an individual's capability set, which included preservation of life, good health, body integrity, sense, imagination and thought, emotion, practical reasoning, affiliation, respect for other species, playing and control over one's environment". These capability sets are common to SWVDs. However, the lack of effective achievement of some of these central capabilities results in emphasising their disability. Limitations of the university or functioning restrictions that are not compensated for by the adaptation of course materials and teaching strategies exacerbate this condition (Dubois and Trani, 2009).

Wells (2019) claims that although Nussbaum's ten central capabilities are all equally important, she focused mainly on two: practical reason and affiliation. It was explained in Wells (2019) that Nussbaum's focus on these two elements was because she believed that the core behind the "intuition of human functioning is that of a dignified free person who constructs his/her way of life in reciprocity with others". This draws parallels with Systems Theory regarding reciprocity, recursion and shared responsibility, where linear causality is not meaningful and relationships involved mutually influencing one another (Becvar & Becvar 2014).

3.4.4.3 Expanding Capabilities (Enhance capabilities)

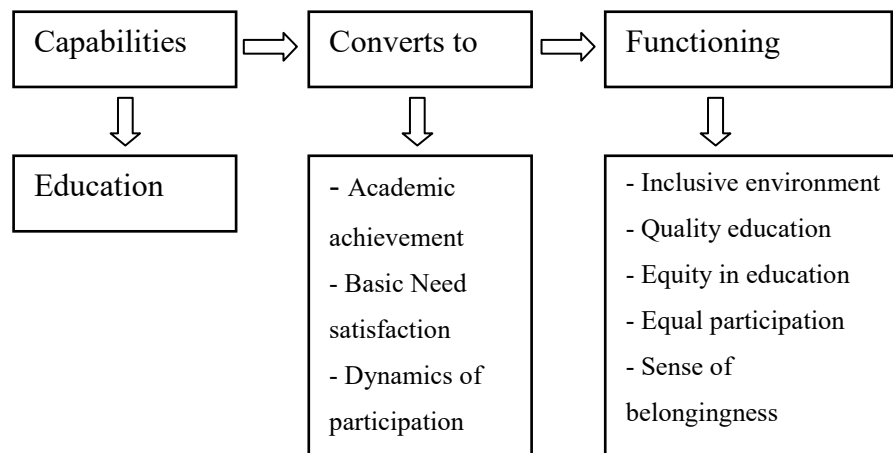


Figure 3. 5: How Capability through Education can Result in Functioning (Schiemer, 2017)

a) Academic Achievements

According to Sen's Capability Approach, capability is understood as a practical opportunity and functioning is the actual achievement of the individual (Mitra, 2006). Broderick (2018) explained that capabilities represent the innate potential of each individual to achieve various outcomes. In other words, what people can do when given real opportunities. If SWVDs are provided with the necessary resources, they will be able to function efficiently and produce the desired outcome or achievements such as reading, writing or communication.

b) Basic Need Satisfaction

The Capability Approach aligns with the Social Model in that the lack of resources can in itself be the catalyst of impairment and/or disability (Mitra, 2006). The lack of resources causes the disability, which draws similarities with the Social Model that sees disability as a social construct. Disability is not centred on the individual but on the social environment that imposes disability by the way SWVDs are unnecessarily isolated and excluded from full participation in society (Mitra, 2006). Therefore, enhancing the capabilities of SWVDs reduces the consequences of disability by increasing opportunities for people with disabilities

and allowing them to choose amongst various opportunities to satisfy their basic need for quality education (Dubois and Trani, 2009).

c) Dynamics of Participation

Dubois and Trani (2009) highlighted important aspects in the application of a participatory approach to inclusive education for SWVDs, namely:

- Participation enables the understanding of different perspectives of the situation and how they are linked;
- Allows for alternative viewpoints expressed by the various stakeholders in defining objectives and implementing them in the respective fields;
- The disabling situation can be explained in terms of capabilities, functioning and freedom;
- Allows for the identification of priorities to be tackled;
- Allows for SWVDs to focus on what they can achieve and identify existing barriers that hamper success; and
- Helps to gather essential information when adopting policy (Dubois and Trani, 2009).

Broderick (2018: Pg. 34) emphasised one of Nussbaum's basic capabilities in an educational context to be the voice and participation of SWVDs in learning. This points to the enabling of SWVDs to develop the capability to “express their views freely on educational matters affecting them and to participate actively in knowledge acquisition”. Dubois and Trani (2009) agreed that the participation of SWVDs was pivotal in understanding the context and dynamics of disability at university. Consequently, the lack of effective systems that promoted participation will lead to shortcomings in the application and adherence to the current disability policy.

d) Human Diversity

Broderick (2018) explained that Human diversity was fundamental in the Capability Approach as it inspired interest in equality and respecting human dignity by creating inclusive environments to cater for this diversity. The university is faced with students with various learning styles and needs to be prepared with effective strategies to make learning

accessible to all students. The Universal Design of Instruction (UDI) ensures that the university is organised with effective techniques to make knowledge acquisition accessible to all students (Burgstahler, 2015). For instance, UDI requires an awareness of the unique nature of each learner to ensure that the class climate prioritises inclusivity.

3.4.4.4 Capability Means the Opportunity to Select

a) Facilitate Retention and Throughput

Drawing from Systems Theory (Becvar and Becvar, 2014), retention and throughput relies heavily on the collaborative efforts of all stakeholders at the university. In conjunction with Maslow's belief, retention of SWVDs relied on factors that involved belonging, involvement, purpose and self-determination. Wessel et al. (2009) contended that the retention of SWVDs resulted from minimising barriers in the teaching and learning environment. However, this study argues that it is not the responsibility of one office or one aspect, but several offices, departments and divisions within a university that are responsible holistically to encourage the persistence of SWVDs towards graduation. The Capability Approach compels the university to respond to diversity and ensure human flourishing (Broderick, 2018). As such, it is every department's responsibility to enact its role in the education of SWVDs. This includes providing academic support, note-takers, scribes, re-formatting services, as well as advising students; providing counselling services; and providing outreach and intercampus consultation with various stakeholders of the university at large.

b) Widening Choices

According to Amartya Sen and supported by philosopher Martha Nussbaum, the capability set refers to the substantive freedoms that one enjoys that will amount to a life of value (Dubois & Trani, 2009). The capability set expresses what a person can do effectively through functioning, provided that opportunities are available to him/her (Dubois & Trani, 2009). Schiemer (2017) emphasised that capability means the opportunity to select. In other words, by widening choices, one can enhance capabilities and facilitate the retention and throughput of SWVDs (Alkire, 2010).

Only an inclusive environment gives SWVDs the freedom to participate and become involved in discussions that help shape societal values. Freedom also describes choices that one may have to lead the type of life that one is expected to lead. As such, the current study promotes UDI principles for implementation as it allows SWVDs to choose from various technology applications to suit their learning needs. Enhancing people's capability will reduce the consequences of disability by increasing opportunities for SWVDs and allowing them to choose a variety of teaching strategies guided by UDI to accommodate different learning styles (Dubois & Trani, 2009).

c) Autonomy

Schiemer (2017) emphasised that the kind of education related to Sen's Capability Approach makes people autonomous. Consequently, autonomy would lead to possibilities to achieve well-being, quality of life, equity and equal opportunities for all people (Schiemer, 2017). This relates closely to Maslow's theory regarding SWVDs who experience educational equity and are granted the opportunity to participate equally in the classroom, who will obtain a more quality education (Maslow, 1943/54).

Importantly, the Capability Approach stipulated that the quality of life and values be identified and specified by the people involved, which parallels with the Social Model of disability. However, the environment must offer the necessary framework condition which includes transformation and development towards a more inclusive education system. This sets the stage for the implementation of UDI, compelling the university to become inclusive as a necessary condition for the transformation and development of SWVDs.

d) Opportunities to Achieve

Broderick (2018) asserted that the student-centred approach associated with Sen's Capability Approach helps to achieve key capabilities such as self-determination, learner autonomy and participation. Wells (2022) complements Broderick's (2018) understanding that UDI principles focus on the design of learning environments that are student-centered as this provided significant benefits to SWVDs and all students in accessing and learning from course materials and classroom activities. Furthermore, it encourages the teaching of self-advocacy skills that help SWVDs learn how to be assertive, effectively communicate their

perspective, negotiate, compromise, and how to interact within a social environment. In concurrence with the current study, Izzo (2012) maintains that Universal Design of Instruction (UDI) strategies will address inequities and enhance the quality of education through flexibility and student-centred learning environments that will ultimately provide opportunities to achieve. The UNCRPD (2006) stated that human potential achieved through the assessment process must allow for flexible and multiple forms of assessments that consider individual progress towards goals and provide alternative routes for learning, motivating the application of universally designed systems. Mitra (2006) claimed that under the Capability Approach, Sen focuses on SWVDs' capability to achieve or accomplish the type of life that they can live. That is, to attain well-being (how well a person can function) given opportunities that they are free to choose. Broderick (2018) agreed that the inclusion of all learners achieved through the mechanism of Universal Design of Learning (UDL) focused on their well-being and is related to Maslow's model applied in this study.

3.4.4.5 Equity

a) Equal Opportunities for All People

The respect for human diversity and equal opportunities are central tenants of the Capability Approach as it focuses on achieving justice by expanding an individual's capabilities (Broderick, 2018). Broderick (2018) and Mitra (2006) share the view that deprivation of opportunities due to failure to provide reasonable accommodation results in disability and constitutes a form of discrimination. Therefore, this study finds the Capability Approach appropriate as it identifies that inclusive education and educational equity are leading approaches to empower SWVDs to live a life they value (Schiemer 2017). In addition, Dubois and Trani (2009) measured the degree of access against opportunities offered to them, such as equal participation, integration, training, empowerment and learning.

b) Equal Participation

Based on the earlier discussion on the dynamics of participation, equal participation is the common thread in the Capability Approach, focusing on making people autonomous and expanding on existing strengths and capabilities. In the same way, McLeod (2014) claimed that Maslow believed self-actualisation involved achieving one's potential. Given the centrality of this construct, Schiemer (2017) declared that only inclusion can ensure participatory freedoms for people with disabilities. The freedom to participate and interact equally in all aspects of education for SWVDs will help shape the values of society by changing ways of thinking in that society by "really being a part of it" (Schiemer 2017).

3.4.4.6 Inclusive Education System

a) Human Development

"Human development focuses on expanding people's real freedoms, their capabilities. When human development is successful, people can enjoy activities and states of being that they value and have reason to value. With human development, people live long and healthy lives"(Alkire 2010:pg.40)

Based on Alkire's (2010) definition of Human Development, the current study draws a brief comparison between applied models and some aspects of the Capability Approach. These include:

- A focus on a people-centred approach to development supported by Broderick (2018);
- Focuses on a notion of freedom related to well-being (capabilities) and agency (empowerment), supported by Hewett et al. (2018) and Maslow (1943/54);
- A focus on freedom being a possibility;
- A well-being objective that embraces multiple capabilities (Maslow 1943/54);
- Focuses on interconnections between different dimensions of human development which relates to Systems Theory (Becvar & Becvar 2014); and
- A focus on people as active change agents who should not be considered passive victims of development. In support, Vianna and Stetsenko (2014) conceded that the

interaction of stakeholders and the researcher are collaborative change agents who are not passive observers or interpreters of reality.

Well-being and personal agency were considered fundamental aspects of freedom and formed a core component of Sen's Capability Approach to human development (Alkire, 2010). The current study emphasisescore aspects such as participation, the personal agency of SWVDs and non-discriminatory practices that Sen's Capability Approach supports.

It was argued by Alkire (2010) that to flourish SWVDs will need cooperative and inclusive institutions and social contexts which contribute to the development of individuals. Therefore, this study undertakes to explore avenues such as UDI to improve pedagogy and to employ policies to advance education for the development and success of SWVDs at university.

b) Transformation

The Capability Approach is best conceptualised by drawing **comparison** and similarities with The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) regarding inclusive education.

Inclusive education is strongly dependent on transformation as change is necessary to enable systems to become inclusive (Schiemer, 2017). Broderick (2018) in support of UNCRPD claimed that the Capability Approach embodied human individuality and focused on interdependency, which relates to Systems Theory (Becvar & Becvar 2014). Furthermore, Article 24 of the UNCRPD (2006) focused on system changes that involved reasonable accommodations and effective student-centred support for SWVDs (Broderick, 2018). Therefore, Sen's capability approach is appropriate for the current study as it ensured educational equity and equal opportunities for all in line with the underlying principles and goals of the UNCRPD (Broderick, 2018).

3.4.4.7 Application of Sen's Capability Approach in Other Studies

Sen's Capability Approach was found applicable in several studies. Such studies included Subrayen and Suknunan (2019) who applied the Capability Approach to help facilitate an understanding of how learning communities provide for the achievement of equitable arrangements in teaching practice for students with disabilities. This study relates to Subrayen and Suknunan (2019) in that teaching practice and suitable learning environments contribute to student development. Furthermore, inclusive environments provide a sense of belonging; encouraged participatory action; showed respect for individual and collective agencies; and promoted disability disclosure to enhance the teaching practice of SWVDs in the classroom. Broderick (2018) applied the Capability Approach as it focused on ensuring equality and developing human potential to overcome limitations within the traditional educational sphere. The current study supported Broderick's (2018), finding that the Capability Approach can offer new insights into the vision of educational equality and the right to education ensuring the full and equal participation of persons with disabilities in a mainstream environment.

Schiemer (2017) revealed that the goal of the Capability Approach is to reach well-being. Consequently, education equity, equality of possibilities and social justice can contribute to achieving well-being and quality of life. However, Schiemer (2017) argued that this can only happen if the environment can offer the necessary conditions. Lang, Kett, Groce and Trani (2011) used Sen's Capability Approach as a conceptual realm to promote and enforce disability rights. Lang et al. (2011) explained that according to the Capability Approach, quality of life relied on an individual's entitlement to choose functions they valued. These included achieving self-respect and being socially included. Furthermore, for persons with disabilities to achieve, more resources are required to compensate for their disability as they face more difficulties in achieving a good life (Lang et al., 2011).

Alkire (2010) explored how the Capability Approach is related to Human Development. Thus, explaining human development to be a dynamic process that involved participation, widening people's choices and the level of their achieved well-being, equally applicable to less developed and highly developed countries. Along similar lines, Dubois and Trani (2009: pg. 198) explored Sen's Capability Approach as it was seen "to enhance people's capability, thus directly reducing the consequences of disability by increasing opportunities for people with disabilities allowing them to choose among various opportunity sets". Dubois and Trani

(2009) affirmed that disability resulted from the lack of effective achievement of central capabilities due to limitations or restrictions not compensated for by social adaptation aligning with the Social Model of disability that shifts focus away from the individual displaying the disability to the social construction of disability that create barriers. Mitra (2006) applied the Capability Approach with a focus on disability at the capability level, disability at the functioning level and actual disability. Furthermore, the Capability Approach was explored in relation to employment and the living standards of PWDs.

3.5 The Amalgamation of Select Models of Disability

Mitra (2006) pointed out that there was considerable debate on what constitutes disability and since no single model can explain disability, a multitude of models that have developed over time may reflect the multifaceted nature of disability. Although, it may be convenient to have one model of disability that is superior to others, embracing different model may convey a useful perspective on disability in a given context (Mitra, 2006).

Thus the three mediating models of the study will be evaluated and applied based on the theoretical foundations laid out in Sun and Jiang (2017); Zajadacz (2015) and Duggan (2012). This process involves three steps: problem (re)formulation, search and evaluate (which further includes three sub-steps: scan, briefly evaluate and analyse in-depth and finally, fully develop (Figure 3.8).

Proposed Universal Design Model Combining 4 Models

Combining significant elements- Problem (Re) Formulation

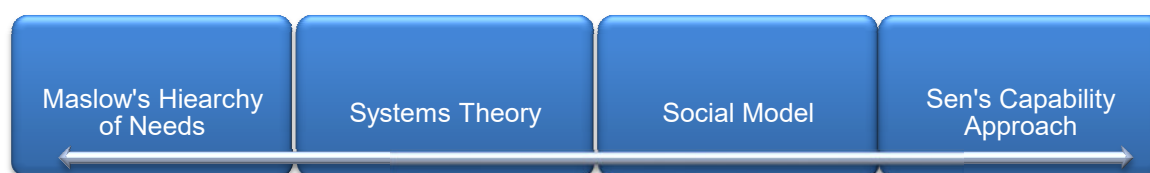


Figure 3. 6: Applied Models of Disability

A proposed strategy for UDI implementation is illustrated in Figure 3.8 below.

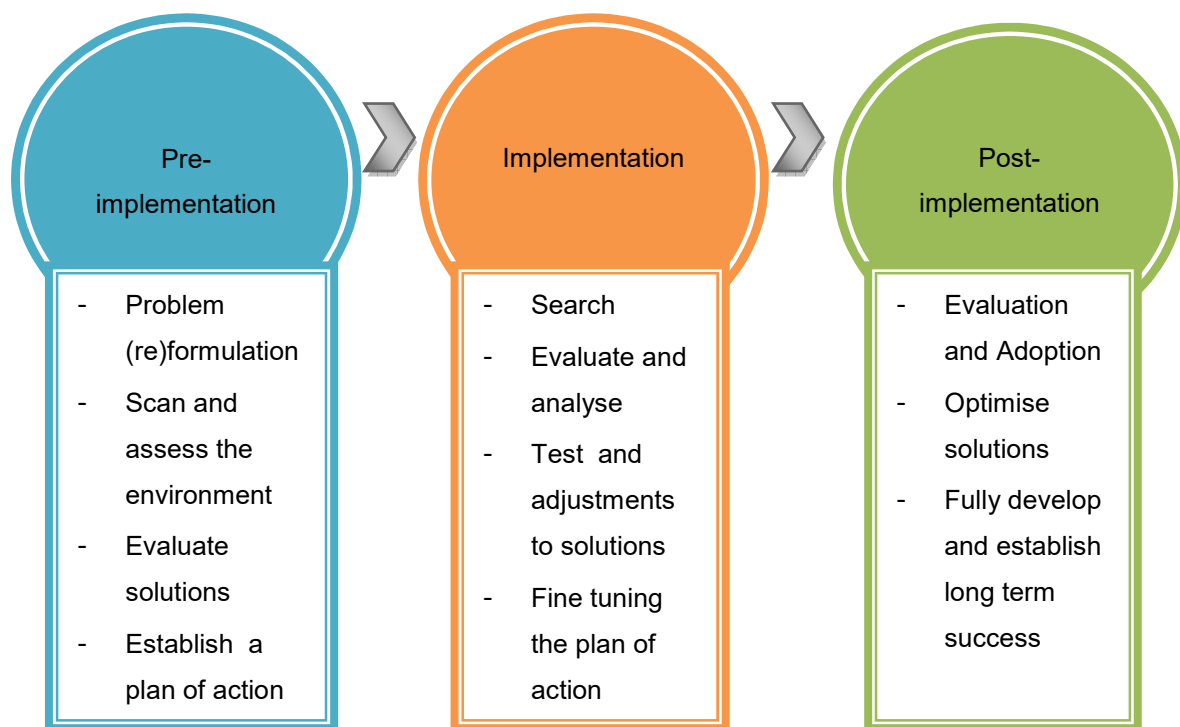


Figure 3. 7: Strategy for the Implementation of UDI (Sun & Jiang, 2017)

3.6 The Proposed Model

Once the mediating models are evaluated, the selected approach is expected to guide the study towards the most important aspects of how educational equity and inclusive education, for SWVDs and the surrounding university community can be enhanced. This approach uses UDI to enhance SWVDs' academic capabilities, contributing to quality education in the classroom (Schiemer, 2017). Drawing from the principles of Systems Theory (Bevar & Becvar, 2014) and the Social Model of disability, the most important aspect in working towards educational equity and inclusive education is the involvement of all stakeholders and surrounding university communities (Schiemer, 2017). Schiemer (2017) argues that a result of experiencing educational equity and being provided with opportunities to participate equally in social systems will improve the quality of life. The current study endeavours to validate the view that inclusivity benefits all and is about changing attitudes through achievements (Schiemer, 2017). On logical grounds, inclusivity should be appropriately positioned at the 3rd level of Maslow's (1943/54) Hierarchy of Needs model recommended in Singh (2017).

This study does not engage with educational discourses as it is not examining 'Higher Education' discourses. Instead, it involves the epistemological access to education in the classroom using UDI (irrespective of discourses). Five applicable frameworks underpinned the study. The study is unique as it employs an international model (UDI) applied to four other applicable models (Social Model of Disability, Maslow's Hierarchy of Needs and Systems Theory, with the intention of UDI supporting learning through enhanced capabilities (Sen's Capability Approach).

3.7 Chapter Summary

The extensive nature of each model compelled the researcher to evaluate the models in a separate chapter. The goal of writing the theoretical framework is to explain the applicability of the chosen theories, how they relate to the gap in the literature and the research questions and objectives. This chapter operationalised the key constructs of the four models applied in the study. The constructs of the models are tied in with the study's aims and objectives that explored UDI to enhance SWVDs' academic capabilities, thus contributing toward quality education in the classroom through the involvement of all stakeholders and surrounding university communities. The models motivated the equal participation of SWVDs in the classroom to enhance their educational experience and obtain a more quality education. The researcher declared her epistemological and ontological perspectives at the onset. This revealed that all participants in the study interacted as collaborative change agents. The review of the various constructs of the models applied showed similarities and instances of overlap. The related constructs merged to formulate the new model in the preceding chapters, responding to the study objective to propose a conceptual model that can incorporate UDI to promote learning outcomes for SWVDs in the classroom. The study is unique as it evaluates the principles of UDI as a single framework interlacing the principles of the four selected models to achieve inclusivity through the formulation of a new conceptual framework. The models were measured for their applicability to the current study by identifying their use in other disability-related studies to motivate relevance. The next chapter describes the research methodology adopted in this study.

Chapter Four

Research Methodology

4.1 Introduction

Based on the research problem defined in Chapter 1, this methodology chapter provides a detailed approach to disability research from the perspective of South African Higher Education Institutions. This chapter will outline the research methodology that the study undertook to answer the research questions and fulfil the objectives of the study. The study adopts a mixed-methods approach, which comprises both the quantitative and qualitative data collection techniques. The sampling strategies will be explained and the target population described. The design and development of the data collection instruments are specified, along with the administration of the respective instruments. Furthermore, the relevant data analysis techniques applied in the mixed-methods approach are outlined. The chapter illustrates how the research instruments tie in with the research questions and theoretical frameworks applied in the study and conclude with the applicable ethical consideration, validity and reliability of the research outcomes and limitations of the study.

4.2 Research Questions and Objectives of the Study

A recap of the research questions and objectives is provided below:

4.2.1 Research Questions

The main research question:

- How can the Universal Design of Instruction promote epistemological access for students with visual disabilities in the classroom?

The study utilised a series of sub-questions to address the research questions.

Sub-Questions

- What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?
- What are the current challenges in learning for students with visual disabilities in the classroom?
- How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?
- What factors must be considered for implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom?
- What type of model can be conceptualised to incorporate UDI to promote learning outcomes for students with visual disabilities?

4.2.2 Objectives

The objectives of this study were:

- To examine the experiences of students with visual disabilities in relation to current teaching practices in the classroom;
- To determine the challenges experienced in learning for students with visual disabilities in the classroom;
- To explore the potential of UDI implementation to facilitate/maximise learning outcomes for students with visual disabilities in the classroom;
- To identify factors that can influence the implementation of UDI for inclusive learning for students with visual disabilities in the classroom; and
- To propose a conceptual model that can incorporate UDI to promote learning outcomes for students with visual disabilities.

4.3 Research Methods / Approach to Study

4.3.1 Research Design

The study applies a mixed-methods approach that uses a combination of quantitative and qualitative research methods. Mixed methods studies focus on the research problem in social

science research and then apply different approaches to derive knowledge about the problem (Creswell, 2009). This approach is associated with interviews (qualitative data) combined with traditional surveys (quantitative data). Creswell (2009) indicated that all methods have limitations, therefore the mixed methods approach could neutralize or cancel the biases inherent in any single method. The University of KwaZulu-Natal provides a suitable environment to explore avenues for advancement, accessibility and equal opportunities and to generate research-based knowledge that can help students with visual disabilities. The study outcomes will be predicated on and will rely on SWVDs across UKZN to become the primary motive for transformation.

This study therefore found a mixed-method approach appropriate due to advances outlined by Radhakrishnan (2014):

- The qualitative and quantitative designs complement each other;
- Provides enhanced theoretical insights;
- Allows continuity;
- Enhances validity; and
- Provides for rectification in the case of differences/ inconsistencies in the result.

4.3.2 Validity, Reliability and Rigour

The researcher utilises both qualitative and quantitative data which were collected, analysed and interpreted simultaneously. In this study, the main research instruments were questionnaires and interview schedules in a mixed-method design. Such a design uses different types of procedures for collecting data and obtaining information, which incremented the validity and reliability of the data and their interpretation (Zohrabi, 2013). The study's instruments were developed around the research objectives and the research questions and measured against the applied theoretical frameworks. Quantitative data were obtained through closed-ended questionnaires and the qualitative data through open-ended interviews. Open questions can lead to a greater level of discovery and will more accurately reflect what the respondent wants to say, whilst closed-ended questionnaires will provide quantitative or numerical data which will enhance efficacy and ease of analysis (Zohrabi, 2013). These different ways of gathering information supplemented each other, and together

with the applied frameworks of the study, boosted its validity and dependability (Zohrabi, 2013).

4.3.3 Location of the Study

The study was located at the University of KwaZulu-Natal, situated in the province of KwaZulu-Natal (South Africa). The study targeted respondents who are registered students with visual disabilities across all 5 campuses, which are situated in different geographical locations of the province. However, the majority of the participants were primarily from the Howard College Campus as the college of Humanities was mainly confined to this campus. The various campuses of UKZN are represented in Figure 4.1 below.

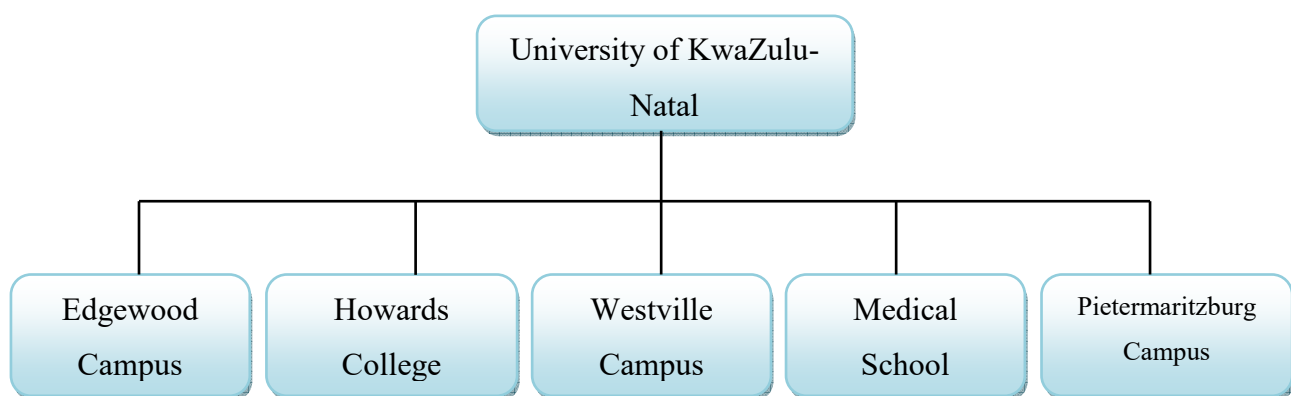


Figure 4. 1: Campuses of the University of KwaZulu-Natal (UKZN, 2019)

4.3.4 Population and Sampling

Due to a mixed method approach, a census approach was used for the quantitative component of the study. Although the majority SWVDs are from the Humanities College (DSU, 2021), the study incorporated participants from four academic colleges at the University of KwaZulu-Natal. These included:

- The College Agriculture Engineering and Science (CAES);
- The College of Law and Management Studies (CLMS);
- The College of Health Sciences (CHS); and
- The College of Humanities (CHUM).

There was a total 709 Students with Disabilities at the time of the study, with a total of 204 Students with Visual Disabilities (UKZN, Disability Support Unit, 2019).

For the qualitative aspect, a purposive sampling method was used as such a method is often used by researchers when carrying out studies with university students (Terre Blanche et al., 2006). It involved non-probability purposive sampling that maximises understanding of the underlying phenomenon of disability in mainstream university. Purposive sampling techniques also allow the researcher to use their judgement in selecting participants relevant to the study (Radhakrishnan, 2014). For instance, in this study, the selected population included all registered students with varying degrees of visual disabilities from all campuses and across all academic colleges of UKZN.

4.3.4.1 Recruitment of Study Participants

- **Quantitative**

The quantitative component involved all students with visual disabilities across the university. The study thus adopted a census method of data collection targeting all students (204) with visual disabilities at the time of data collection.

Questionnaires were distributed via an online platform through Google Forms® and the link was circulated to all SWVDs with the assistance of Disability Coordinators and Specialists at the university. Creswell (2009: n. p.) explained that “survey research provides a quantitative or numeric description of trends, attitudes, or opinions of a population for data collection, with the intent of generalizing from a sample to a population”.

- **Qualitative**

The qualitative component comprised in-depth interviews targeted at 20 students with visual disabilities of which with 15 students with visual disabilities responded. The interviews served to trace their lived experiences of epistemological access to the curriculum across all five campuses.

Category	Total
Glaucoma	4
Totally Blind	3
Low Vision	3
Blind one eye	2
Web Formation	1
Optic Neuritis	1
Albinism	1

Table 4.1: Range of Visual Impairments

There was representation from almost every campus and from a range of visual disabilities which was seen as positive. However, Howard College and Edgewood Campus had the most respondents.

4.3.5 Data Collection Methods and Instruments

4.3.5.1 Construction of the Instrument

All instruments are to be built around the study's research questions and theoretical frameworks to allow for effective underpinning. (Refer to “Appendix 3” and “Appendix 4”)

a) Quantitative

A questionnaire built on Likert Response Scales was used to extract statistical information. This data collection approach is suitable for acquiring information from a large group of students with visual disabilities within a relatively short period. The questionnaire was also built around the constructs of UDI principles and the theoretical models so they could be applied to the study via the analysis. It was also to statistically conceptualise a predictive UDI model for epistemological access to education as a model cannot be proposed without a quantitative analysis. A study of this magnitude requires a quantitative approach when validating the study from a model development perspective.

b) Qualitative

The qualitative component comprised interviews with SWVDs that were conducted after prior arrangements with Disability Coordinators at each campus of the university. After consent and ethical issues were explained, the researcher clarified the aim and purpose of the study to the participant. An interview schedule comprised open-ended questions capturing the views of SWVDs based on their individual lived experiences in their classrooms.

Mapping of Research Question and Sub-Questions to the Model

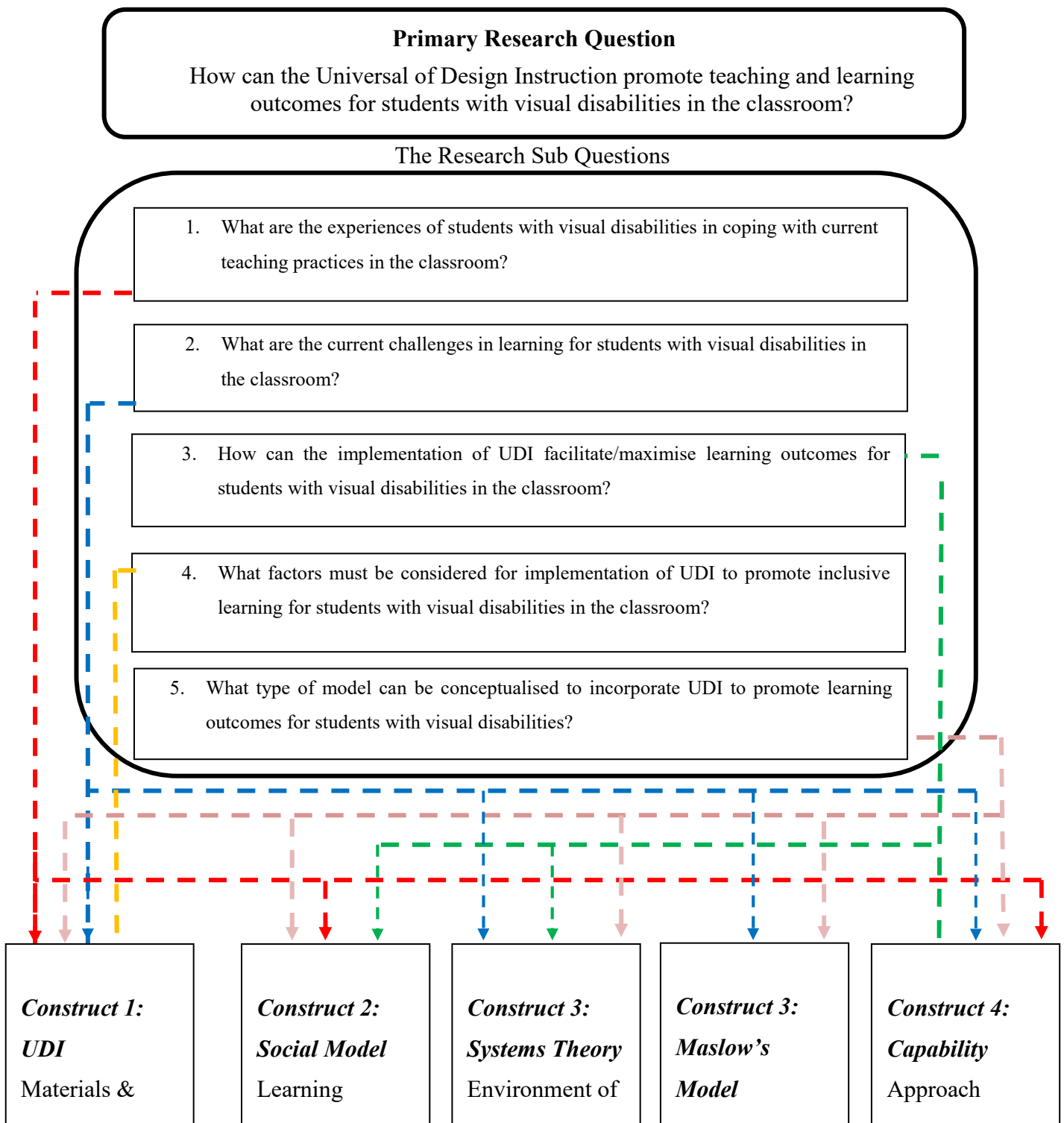


Figure 4. 2: Mapping the Research Questions to the Models

4.3.6 Pre-testing and Validation of the Research Instrument

The validation and testing of both the interview schedule and the survey questionnaire ensured content validity and allowed questions to be improved upon before incorporation into the final instrument.

- a) **Survey Questionnaire-** The questionnaire was validated by ensuring that the questions were derived from the research questions in association with the constructs of the models. Likert scaling ensured that responses were precise and dichotomous
- b) **Interviews-** The Interview schedule was validated by ensuring that the questions were derived from research questions and were open-ended questions, allowing the participants to fully express their viewpoints and experiences and follow up questions were asked to ensure reliability (Turner, 2010). In addition, all interviews were recorded and kept in a safe location.

In preparing the research instruments, it is vital to conduct a pilot test to assist the researcher in determining if there were flaws, limitations or other weaknesses within the instrument design. This allows the researcher to make the necessary revisions before its administration in the study and permitted the refinement of the research questions (Turner, 2010). To further validate the research instruments the Disability Information Access Officer, who is also blind, validated the research instruments, in order to test screen-reading capabilities and ensured that the questionnaire was accessible and readable via screen-reading software to students with any visual disability. Being completely blind himself, he was able to read the questionnaire with ease via screen-reading software, which thereby confirmed reliability and accessibility.

4.3.7 Data collection and Response Rate

- **Quantitative**

For the quantitative arm of the study, the data collection process involved the administration of questionnaires to SWVDs in appropriate formats, which is consistent with the sample population that is directly affected. Due to the existing COVID-19 protocols, the dissemination of questionnaires to SWVDs in person was not permitted.

As a result, an online tool known as Google Forms ® was used to facilitate the distribution of the survey to a large audience of students with visual disabilities.

Due to the nature of the disability of participants (SWVDs), the Disability Coordinator was consulted to assist with the distribution of the online questionnaire link to SWVDs to access the online questionnaire. This was emailed and whatsapped to all SWVDs who agreed to participate in the study. To facilitate ease of access, the consent document was also incorporated into the online questionnaire. The response rate for the quantitative component was 21 respondents which contributed to almost 10% of the total population of students with visual disabilities. This was confirmed by an almost equal distribution of a range of visual disabilities reported by all 21 respondents, providing rich data with first-hand accounts of their experiences.

- **Qualitative**

All interviews were telephonic due to COVID-19 restrictions concerning reduced contact with others to prevent the spread of an incurable virus. As such, interviewees were contacted on their cell phones and the interviews were recorded using a digital Dictaphone/recorder. The disability coordinator also helped with the distribution of the invitation to participate in the interviews to SWVDs via email and whatsapp. It was discovered through this process that SWVDs were more likely to respond when a voice recording of the invitation to participate was made available to them via electronic means. Consent was read to participants by the researcher prior to the commencement of the interviews and notified SWVDs that this recording constituted their consent to participate in the interviews.

A total of 15 SWVDs agreed to participate in the study. The interview participants also provided an almost equal distribution of a range of visual disabilities, providing an in-depth understanding of their lived experiences within the classroom across all five campuses at the university.

The researcher abided by eight principles outlined by Turner (2010) at the interview stage. Hence, the interview schedule applied the following interview protocols to maintain consistency across all interviews:

- The researcher secured appointments to interview students at their convenience in a setting of their choice with little distraction;
- The purpose of the interview was explained;
- Anonymity and terms of confidentiality were discussed;
- The format of the interview was explained;
- The approximate time duration of the interview was indicated;
- All contact details were made available to get in touch with the researcher;
- The participants were informed about their freedom to ask questions before, during and after the interview; and
- Participants consented to have their interviews recorded.

4.3.7.1 Storage

The quantitative survey questionnaire was made available to participants via Google-Forms, which is an online tool. Therefore, responses were anonymously recorded on GoogleForms. The forms were closed at the end of the study to prevent further access to the questionnaire. Only the researcher and her supervisor had access to the responses. The quantitative data was stored on an Excel Document that was automatically created via the online Google Forms Platform. This was automatically stored on the researcher's 'GoogleDrive', which was password protected and inaccessible to anyone else without permission.

All interview recordings were anonymously labelled with the date/time and alias names. The transcripts of the interviews were provided by an outsourced service that was obliged to sign a confidentiality form. The recordings and transcripts were stored on the researcher's personal computer, which is access controlled with a user name and password.

4.3.8 Data Analysis

The study incorporated quantitative and qualitative data collection concurrently as the analysis was presented in separate chapters. However; the analysis and interpretation combine the two forms of data to seek convergence or similarities amongst the results through methodological triangulation (Creswell, 2009). Kelle, Kühberger and Bernhard (2019) explained that methodological triangulation was a validation of results by a combination of methods describing research data more comprehensively with different but complementary results.

4.3.8.1 Quantitative

The gathered data was analysed and interpreted using quantitative techniques and advanced statistical methods. The data collected from the 21 respondents and the results were analysed and presented using descriptive statistics and inferential techniques.

a) Reliability Testing

Cronbach's Alpha was used to measure the consistency and dependability of the data.

b) Descriptive Statistics

These were frequency-based and in the form of charts and graphs, and described the characteristics of the sample set such as age, gender and nature of disability amongst others (Hayes, 2022). This provided a descriptive picture of the current situation based on the perceptions of students. There are two types of descriptive statistics: the measure of central tendency and measures of variability, both of which are applied in analysis of the data.

c) Inferential Statistics

These are required to understand how variables interact with one another in a data set and helps understand the collective properties of the elements of a data sample (Hayes, 2022). The following inferential statistics were applied in the study:

- **Pearson's Chi-Square**-to determine whether there was a statistically significant relationship between the variables and to establish relationships and 'goodness of fit' between biographical/demographic factors and questionnaire variables.
- **Correlations**- to determine directly or inversely proportional relationship between key variables and constructs.

These tests proposed above were all possible and attainable through specialised software known as Statistical Package for Social Sciences (SPSS) version 21.

4.3.8.2 Qualitative

The analysis of qualitative data involved qualitative techniques which included thematic analysis inclusive of interpretive phenomenological analysis to understand participants' lived experiences and perception of events in detail. Thematic analysis entailed word clouds, cluster analysis, tree mapping, hierarchy charting and word trees, which were performed using NVIVO 12 analysis software. This was further supported by the researcher's interpretive analysis.

4.4 Ethical Considerations

All research involving students with visual disabilities as participants had to meet the UKZN ethical standards for research involving human subjects. Studies concerning students with visual disabilities are no different as all ethical issues must be practiced from a human science perspective. Students with disabilities should not be confined to the 'Medical Model' of disability whereby people with disabilities require 'specialised' ethics. This was not the case in this study as it was a Social Science/Behavioural/perception-based study where students with visual disabilities are seen as equal to any other student on campus.

For this reason, the research was only conducted after ethical clearance was obtained from the Humanities and Social Sciences Research Ethics committee. In addition:

- A Gate-keeper's letter of authorisation to conduct research was obtained from the University of KwaZulu-Natal.

- The Research Office, encouraging more telephonic/electronic research during COVID-19, authorised interviews to be conducted telephonically or via electronic means including the Zoom platform or telephone.
- As part of UKZN's ethics, the researcher was not permitted to send anything directly to participants' emails or know their emails. Therefore, when it came to the distribution of the online questionnaire, a neutral platform/person (which in this case was the Disability Coordinator and Disability Information Access Officer) was consulted to assist this process to ensure that participants remained anonymous to the researcher.
- The type of research study ensured that the participants were in no way harmed physically, psychologically or emotionally, nor were their reputations to be damaged in any way as anonymity and confidentiality were strictly maintained (Wagner et al., 2012).

Informed consent was followed throughout the research. Wagner et al. (2012) emphasised that each participant had a personal right to agree or not to participate in a research study after fully understanding the total research process and consequences. As such, three compulsory general principles were adhered to, based on Wagner et al. (2012: pg. 68):

- The participants could withdraw from the research at any time;
- Participation was voluntary; and
- Participants must understand that the research might have an impact on their emotional or physical well-being. For that reason, the contact details for psychological support pre/post interview or survey was detailed on the consent form and dictated to the participants at the interviews.

In addition, the following considerations were equally important and conveyed to the participants:

- Their right to safety was explained by ensuring that the participant understood what was expected of them and how it would affect them
- One of the methods used to target all SWVDs to encourage participation in the study was to inform SWVDs about the survey questionnaire via electronic means on the university's website. The assistance of the Disability Coordinator was necessary to

ensure that SWVDs were informed about the study and made aware that they all had an equal opportunity to participate in the study.

- Participants were informed about what the study was about, how the results would be used and how anonymity and confidentiality was to be maintained.
- Participants were informed that there are no right or wrong answers and that they were free to decline to answer any questions if they chose to and could discontinue with the interview at any time.
- In the face of Covid 19, the researcher was compelled to apply alternative methods for data collection. Conventional methods went against Covid-19 protocols. Therefore, face-to-face interviews and the dissemination of questionnaires to SWVDs in person were not permitted.

The researcher clarified the purpose of the study, their expected contribution and the uses of the data generated. The consent information was incorporated in the online questionnaire and the researcher read out the consent information to the participants prior to the interviews and recorded their responses that gave consent to voluntary participation.

The researcher committed to critical self-analysis when interviewing SWVDs. Her ontological standpoint was continuously negotiated contested and adapted in her dialogue and collaboration with SWVDs. Power relationships between researchers and participants were closely examined to ensure that processes such as the recruitment of participants, development of research questions and analysis of results were carefully interpreted such that injustice and misrepresentation of power were avoided (Wagner et al., 2012).

4.5 Chapter Summary

This chapter featured the research methodology of the study. The research design was used to structure the research study, which included a mixed-methods approach comprising both quantitative and qualitative data collection techniques. The location, population and sampling aspects of the study were described. In addition, the construction of both instruments was detailed in terms of the research questions and model alignment, as well as validation and testing. Building on this, the data collection techniques and method were outlined. Furthermore, the data analysis methods were described that were found to be fitting the data

obtained and in satisfying the research questions. The next chapter consists of a detailed qualitative data analysis and discussion.

Chapter Five

Qualitative Analysis and Discussion

5.1 Introduction

The study utilised a mixed method approach, which was discussed over two chapters. This involves philosophical assumptions; the use of qualitative and quantitative approaches; and the mixing of both approaches. It not only involved collecting and analysing both types of data, but also the use of both approaches to increase the overall strength of the study. This chapter features an analysis of the qualitative data collected and a discussion of the results. The qualitative research design aims to explore the lived experiences of students with visual disabilities (SWVDs) in a higher education setting. The primary data emanated from interviews with SWVDs. The preceding chapter evaluated the quantitative statistics obtained through a survey method to corroborate findings revealed in the qualitative data. The study adopted a qualitative and inductive approach to the analysis, backed by proof in the numbers revealed in the statistical analysis. A backdrop of literature is then provided to contextualise findings and the theoretical frameworks are applied via the results of the study. Each theme is carefully unravelled and explored in detail, rounding up the findings in the summary. The applicability of each theoretical framework is further substantiated.

5.2 Definition of Key Qualitative Techniques

This section shows the key analysis techniques employed using NVIVO to formulate themes and sub-themes.

- **Word clouds:** Word Clouds demonstrate the most frequently used words. The larger the font, the more the word was used. This helps to identify key areas/themes. Word Clouds are dependent on a holistic perception where the words cluster according to frequency, which reveals the truth of what participants wished to communicate versus the reality of frequency counts (Bletzer, 2015).



Figure 5. 1: Word Cloud Diagram for all Interviews

The data highlighted significant words frequently emphasised by SWVDs, such as students, disability, lecturers, visual, understand and classroom.

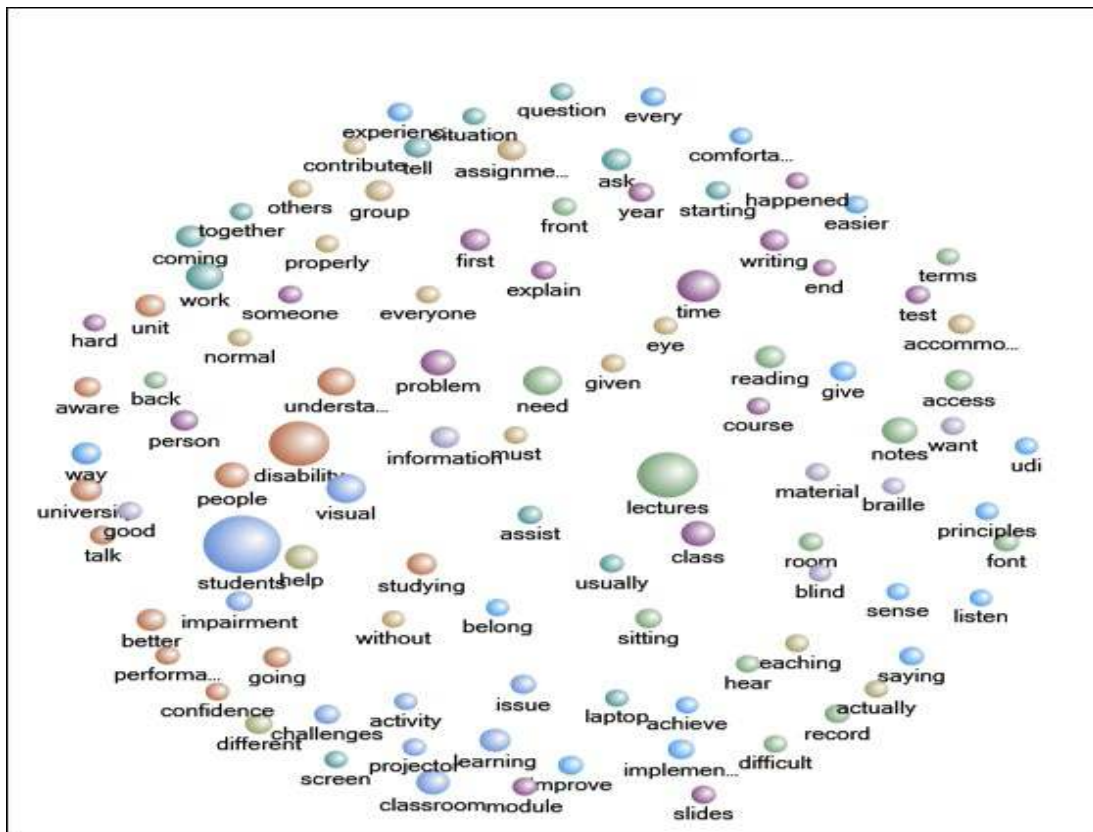
- **Tree-Maps:** Tree-Maps show the data (frequently used words) in terms of the size of the blocks. Hence the larger blocks reflect those words mainly used. The entire map gives a holistic view of how data is placed in terms of size of reference. Tree-maps are a very useful interactive visualisation tool for the identification of extreme values in a large database that allows the researcher to present categorical data (Jadeja & Shah, 2015).

students	disability	need	problem	help	first	coming	access	impaired	year	explain	experience	record	saying	starting	assist
										given	good	slides	easier	eye	materials
		understand	people	university	ask	information	going	sitting	challenge						
							person	accommodate	issue	perform	someone	principle	everyone	normal	actually
				learning	way	assignment				room	teaching	hear	activity	belong	laptop
	time	work	class				different	implement	every			must	audi	end	screen
lectures				unit	better	group				test	usually				sense
							tell	give	talk			project	contribution	situation	achievement
	visual	notes	classroom							module	confide				blind
				reading	studying	writing						properly	course	terms	braille
							aware	font	improve	front	want				happened
												question	back	without	comfortable
															listen

Figure 5. 2: Tree-Map Analysis Diagram for All Interviews

The tree-map extracted from all of the data identified words mainly used by SWVDs such as: students, disability, lecturers, time and visual, amongst many others.

- **Cluster analysis:** Bubble diagrams were used to illustrate the data (key words) in the form of ‘bubbles’. The larger the bubble, the higher the frequency of words/references (van Eck & Waltman, 2009). Furthermore, the colours and closeness of the bubbles indicate that those words were related (belonging to the similar cluster).



- Hierarchy Charts:** Hierarchy charts reflect the size of the nodes. The larger the size, the more volume/concentration of responses in that area. The Hierarchy charts for this study reflect a concentration of responses for Theme One (Classroom experience) where challenges and negative experience is larger than positive experiences.

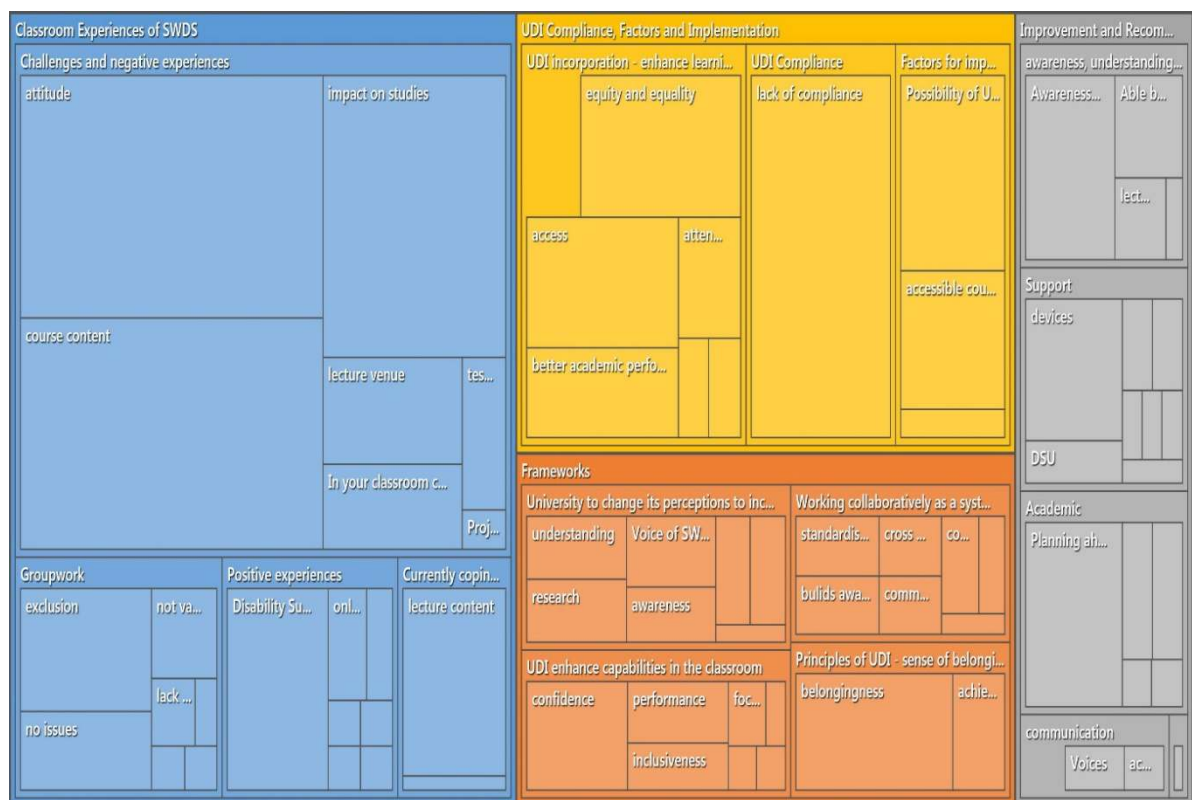


Figure 5. 4: Cluster Analysis Diagram for All Interviews

- Word Trees:** Word Trees are used to depict key words and the words/sentences connected to that word. It allows one to see how these words connect to other words and sentences/views.

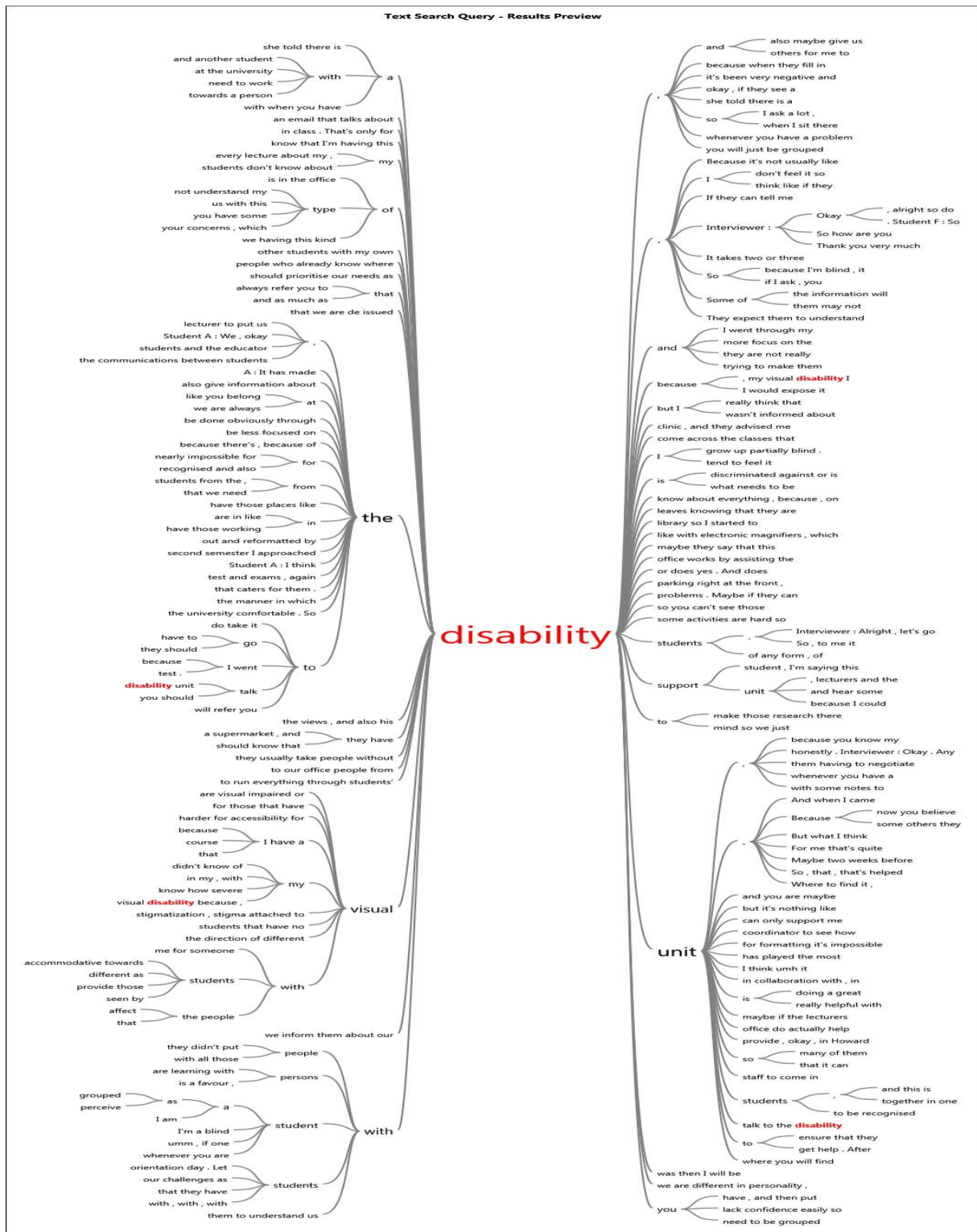


Figure 5. 5: Word Tree of the Term ‘Disability’ For All Interviews

Looking at the word tree for the term ‘Disability’, certain sentences were noteworthy:

Words	Sentences
Negative	Whenever you have a problem you will be grouped and isolated.
Communication	Lack of communication between students and the Disability Support Unit and other stakeholders.
Information	Needs of SWVDs require prioritisation in terms of the provision of information about DSU.
Recognised	SWVDs’ needs are not recognised therefore they lack confidence to request accommodations.
Discriminated	The university is comfortable with current provisions and expect students to understand thus, discriminating SWVDs.
Reformatted	Reformatting by the Disability Services Unit.
Electronic magnifiers	SWVDs require the use of electronic magnifiers especially at the library.
Lecturer	Informing lectures about disability left SWVDs with very negative experiences
Stigmatisation	There is stigma attached to visual disability as we are different in personality.
Orientation day	SWVDs should be informed about services offered by DSU in collaboration with other stakeholders on the day of orientation.

Table 5.1: Sentences Derived From a Selected Word Tree

5.3 Analysis and Generation of Themes

The data was found to be acceptable to perform deep qualitative analysis. The analysis generated 4 primary themes, namely:

- **Classroom Experiences of students with visual disabilities**
- **Frameworks**
- **Improvement and Recommendations**
- **UDI Compliance, Factors and Implementation**

Each theme presented a plethora of sub-themes, which will be unpacked and discussed in the sections to follow. It will begin with a biographic data narrative.

5.4 Biographical Details of Interviewees

5.4.1 Age

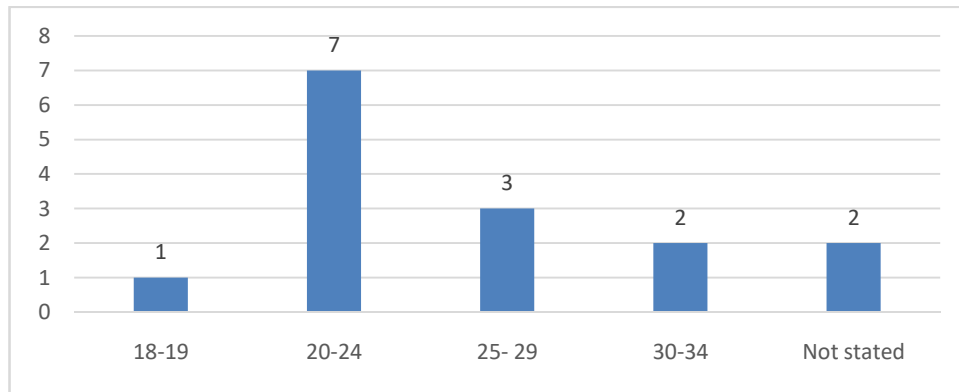


Figure 5. 6: Age Range

The majority of respondents were above the age of 20, thereby indicating maturity and experience in their studies. This meant that they would be able to provide in-depth accounts of their experiences.

5.4.2 Year of Study

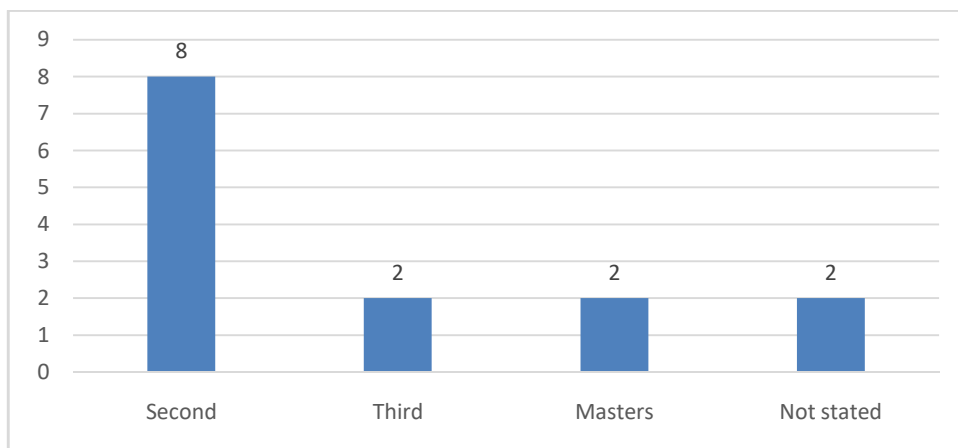


Figure 5. 7: Year of Study of Participants

The majority of students were in their second year of study. This indicated that they were already accustomed to the learning environment in the classroom for more than a year and could provide detailed perceptions thereof.

5.4.3 Course of Study

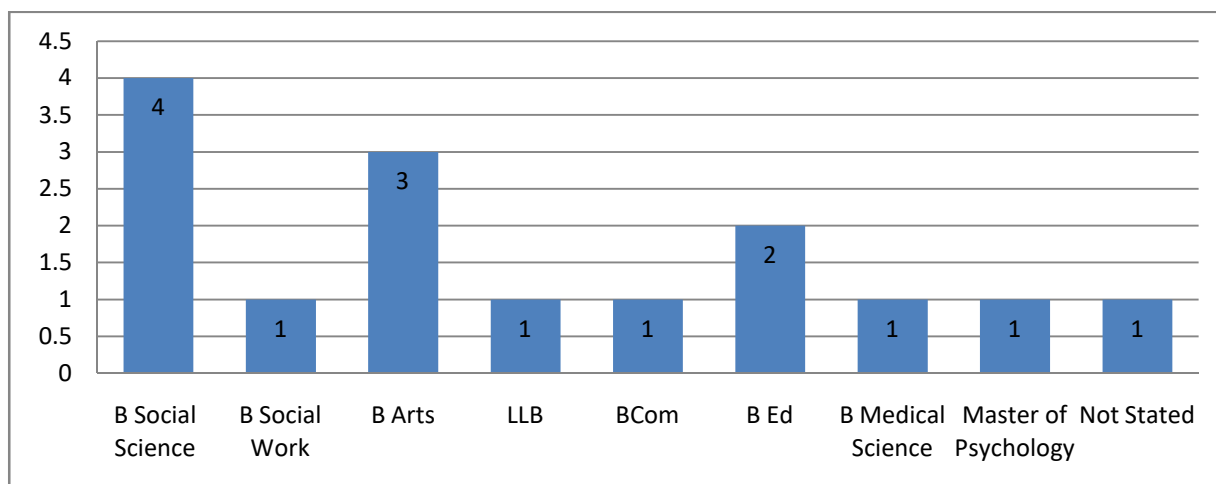


Figure 5. 8: SWVDs' Courses of Study

There was a diverse distribution of qualifications that students were enrolled in. However, these were confined primarily to the Humanities field, mainly because a majority of students with visual disabilities were from the Humanities College historically (DSU, 2021)

5.4.4 College of Study

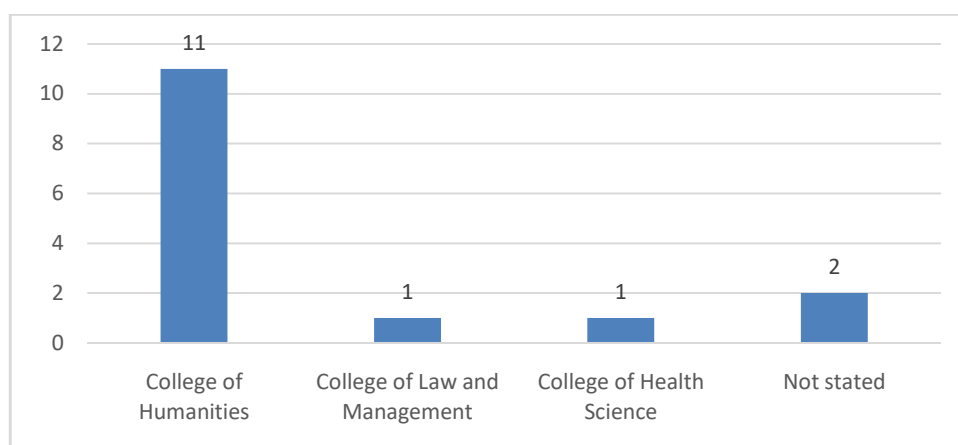


Figure 5. 9: Representation of Colleges where SWVDs are registered

Relating to previous statistics, the majority of students came primarily from the College of Humanities. This was a logical finding as a majority of student with visual disabilities are from the Humanities College (DSU, 2021).

5.4.5 Campus

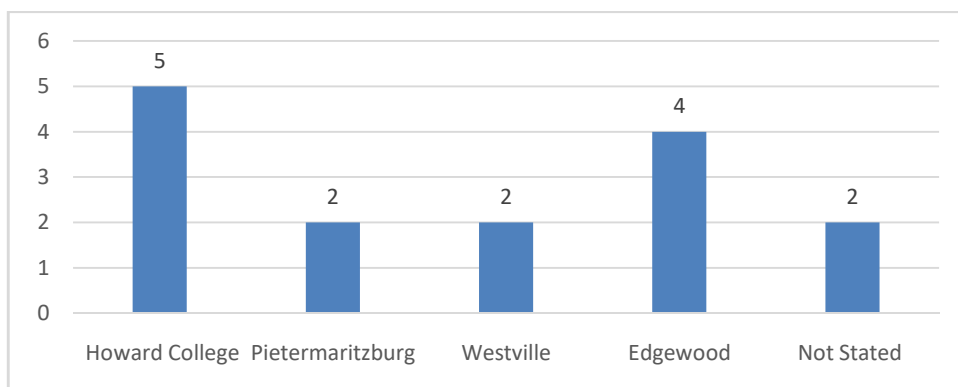


Figure 5. 10: Representation of Registered SWVDs at UKZN Campuses

There was representation from almost each campus, which was seen as positive. However, Howard College and Edgewood Campus had the most respondents. This is a logical finding as the College of Humanities was mainly confined to these campuses.

5.4.6 Nature of Disability

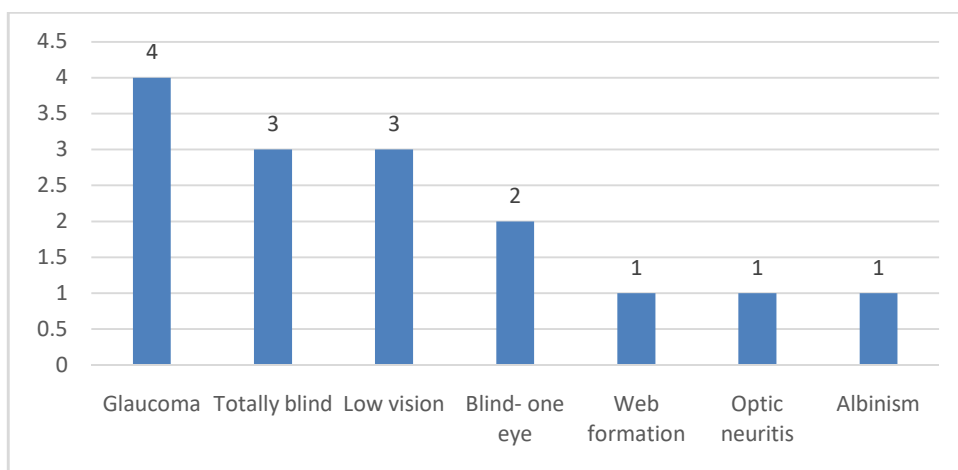


Figure 5. 11: Range of Visual Disabilities

There was a plethora of visual disabilities amongst respondents. This was a positive finding as it added richness and depth to the study because students with various visual disabilities were able to provide an account of their lived experience in the classroom whilst having such disabilities.

5.5 Theme One-Classroom Experiences of Students with Visual Disabilities

This Key Theme examined the classroom experiences of students with visual disabilities. This was pertinent in discovering their experiences and challenges in order to determine how UDI could influence their experiences.

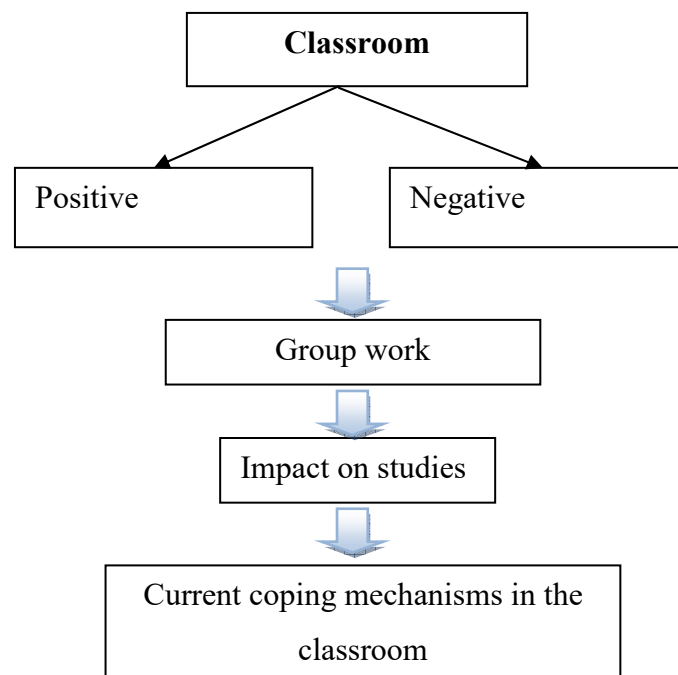


Figure 5. 12: Theme 1 Breakdown

lectures	know	ask	read	group	understand	tell	explain	test	contribute	experience	give	given	inform	studying
		think	things	visual	class	first	font	unit	start	cos	eye	going	modules	slides
	disability					people	way	year	well	access	accom	failed	impair	person
students		trying	work	take	using	done	classroom	difficult	challenge	front	situation	become	blind	normal
	see					put	every	learning	hear	issue	talking	saying	terms	venue
		assignment	writing	notes	help					make	went	bad	look	material
time	problem	need	able	find	feel	come	question	something	record	end	actual	happen	marks	point
														three
														two

Figure 5. 13: Tree Map for Classroom Experience

This theme was informed by four primary sub-themes each of which are unpacked in the sub-sections below.

5.5.1 Positive Experiences

This section reflects the positive experiences thereof. It was classified into the various sub-themes that inform positive experiences in the classroom.

5.5.1.1 Disability Support Unit

Currently, it is primarily the Disability Support Unit that plays a key role in enhancing the classroom experience for SWVD. However, this negates the concept of UDI because the University should be more UDI-compliant.

a) Accommodation

Findings indicate a lack of accommodation for SWVD.

Ntombela's (2013) findings suggest that universities must be organised in ways that support learning for all. This suggests that there is opportunity for change, paving the way for a better system to support inclusion.

Yeah, they were because there's, because of the disability unit. And when I came to the, our, I've got in, through the access programme, the extended curriculum programme, right.

<Files\Audio Interview with Student F> - § 2 references coded [1.55% Coverage]

Reference 1 - 0.78% Coverage

After gaining the help I am never failed another stats paper again in fact my grade shot up, because of the accommodation that have made for me at UKZN. I was able to write in a well-lit venue where it was bright, I did not have no eye strain, no eye squinting it was just amazing, it was something else.

Reference 2 - 0.77% Coverage

Yes, by the second semester I approached the disability support unit because I could not go on further with lighting venues that had terrible lighting and also made other accommodations. So I was able to write in a venue that was separated, it was just for myself and another student with a disability.

<Files\Audio Interview with Student P> - § 1 reference coded [0.61% Coverage]

I remember for instance for students with visual disabilities they printed out assignments bigger fonts than others because they ask which fonts are we comfortable with? Then they will print out a question paper with bigger fonts.

A student admitted that delivering the curricula to a diversity of learners proved to be a challenge. Some students are only able to acquire assistance after the first semester, which is 50% through the students' first year at the university. Student F verified in his/her response that accommodation and academic progress have a direct correlation. Students supported the

contention that at UKZN, it is the DSU that is mainly responsible for initiating solutions to problems experienced by SWVDs and proposing alternatives to lecturers, which validates the claim that there is no universally accepted system in place.

Derived from basic teaching strategies, UDI applies a common-sense approach to instruction where the outcome is intended to increase the opportunity for diverse learners to fully participate in the learning environment (Munene, 2017). This study highlights the struggles that SWVDs experience to promote inclusion. In response to the situation, the university established the DSU as part of the transformation for inclusive education. However, this response to the needs of SWVDs is not enough. What the university requires is a universal design system that ensures that learning and instruction are inclusive and presented in flexible formats in every classroom. To increase the epistemological access and independence of all students at the university, UDI implementation is appropriate in creating instructional goals, methods, materials and assessments that work for everyone (Black et al., 2014).

b) Communication and Understanding

Student respondent A expressed that to receive the necessary help in the classroom, they have to go via the DSU who would then liaise with the relevant staff members on their behalf. This indicates a lack of understanding since learning is enhanced through reciprocal and cooperative relations within the classroom. Student A understood that learning is enhanced when it is collaborative and social, which aligns with Systems Theory (Becvar & Becvar, 2014).

<Files\\Audio Interview with Student A> - § 1 reference coded [0.54% Coverage]

So the disability unit is really helpful with that is one of the positive experiences I have to basically connect and communicate umh properly umh communicate with other students with my own disability, and others for me to actually cope at the university. There is more I just umh

<Files\\Audio Interview with Student O> - § 1 reference coded [0.46% Coverage]

Like after a few weeks they tried to help me because I went to the disability clinic, and they advised me they advised me to go to the optometry room, so that's where they started to help me.

Ntombela (2013) describes the Disability Office as a connecting bridge between SWVDs

experiencing barriers in their learning and the method of instruction. However, had the university complied with UDI, SWVDs would have equal access to educational dissemination (e.g. Braille given by lecturers in classrooms and screen-reading software on every computer in the schools). If the university was UDI-compliant, there will be no need for the existence of a DSU. To achieve this end requires knowledge of how to properly include SWVDs through an understanding of how to provide appropriate accommodations, curriculum, class materials and choices in instruction that create barriers to the education for SWVDs (Black et al., 2014). This research study positioned itself to understand exclusionary processes inflicted on the visually impaired through the lens of SWVD by interacting and communicating with them about their lived experience within the university environment.

c) Support

It is evident from the student conversations below that there is an overwhelming dependency of the university community on the services of the Disability Support Unit (DSU). Although there are support programmes in place, there needs to be constant evaluation of whether or not lecturers were already incorporating some of the principles of universal design in their current teaching methods in the classroom (Black et al., 2014). Responses from SWVDs indicated that the university is providing a reasonable service, but this stemmed from the complacent nature of SWVDs who are happy with the limited accommodations they received in the classroom.

<Files\Audio Interview with Student B> - § 1 reference coded [0.29% Coverage]

And we, I think, I think we're getting support that we need from the disability S. For me that's quite positive.

<Files\Audio Interview with Student J> - § 1 reference coded [0.37% Coverage]

I even attend the meeting there on the DO, even this week I have to attend ehh meeting that is taking ehh place from Monday to Friday to library, online learning.

The Disability Services Unit is the university's only means to support students who experience barriers to learning (Ntombela, 2013). However, Madriaga et al. (2010) argued that it should be about enhancing the student learning experience and providing quality education for all. Moreover, all students will benefit from an inclusive practice agenda such as a UDI system designed to support all students (Madriaga et al., 2010). Such a system

should not be viewed in light of inclusivity or diversity issues only as it is in fact an issue of ensuring overall quality teaching and learning for all students within the higher education classroom.

d) Library Learning

Accommodations refer to all the adjustments that are necessary to ensure that people with disabilities can function effectively (Ntombela, 2013). It was derived from the students' responses that it would make it easier for them to access information at the library if librarians are fully aware of their needs and know how to assist them. Students believe that if the university worked collaboratively, it would increase awareness and prevent the awkwardness of constantly having to inform people about their disability.

<Files\Audio Interview with Student J> - § 1 reference coded [0.56% Coverage]

library learning for this quick/what resources are we going to use in order to access knowledge about our assignments, even save everything concerning our studies. And we are still having Zoom meeting from 9 o'clock up until three o'clock late.

<Files\Audio Interview with Student O> - § 1 reference coded [0.47% Coverage]

She explained to me that they have students with disability, she told there is a disability library so I started to gain hope, I started to enjoy the classes cos now I knew they going to help me.

In their study's findings, Madriaga et al. (2010) substantiated this claim as SWVDs face more difficulties than students without disabilities with respect to the amount of time required to complete assignments, physical difficulties with writing and difficulties with literacy skills. Working with the learners collaboratively with all the relevant stakeholders will help library staff gain a common understanding of the challenges faced by SWVDs. Consequently, SWVDs will perform better at tasks assigned to them by lecturers.

Ntombela (2013) asserts that accommodations that are properly utilised will uphold the dignity of SWVDs, giving them a sense of autonomy usually taken for granted by those without disabilities (Maslow, 1943/54). Unfortunately, libraries do not seem to prioritise the access requirements of SWVDs. Hence the contentment and relief expressed by Student O with the realisation that help was attainable.

e) Comfort and Exposure

Principle six of UDI stipulates that the design can be used efficiently and comfortably and without strain (Burgstahler, 2012). Students with visual disabilities expressed in their dialog that a comfortable experience was solely due to interactions with the DSU.

<Files\Audio Interview with Student A> - § 2 references coded [0.77% Coverage]

Reference 1 - 0.31% Coverage

I think the disability unit has played the most part of the good part of ummh of my experiences, the positive experiences I'm having at UKZN. I would say umh

Reference 2 - 0.46% Coverage

It has made the disability unit I think umh it has helped me in a way become more you know sometimes in a university environment, there are a lot of people to meet that you need to go through to make your stay at the university comfortable.

<Files\Audio Interview with Student A> - § 1 reference coded [0.66% Coverage]

actually experience or rather umh it has exposed me to opportunities especially in both umh and being to different kind of people that I only heard of, people failing payment and that are able to pay and that is I think it's the most positive experience I have had at UKZN. They expose us to more than just academic work basically and yah.

It is apparent from the conversation of Student respondent A that comfort, exposure, all aspects of inclusion and educational equity is limited to the interaction of SWVDs with the DSU. This does not conform to the core functions of the university with regard to SWVDs and the expected reciprocal relationship (Systems Theory) (Becvar & Becvar, 2014). Equity in education should embrace Hewitt et al. (2018) philosophy to move students out of their comfort zones to experience independence through both structural influence and the sense of agency and control as they enter adulthood and experience different stages and forms of independence. This embraces what was theorised earlier in Maslow's hierarchical framework, which stated that SWVDs want to be independent like others, rather than be held prisoners by their hostile environments (Ntombela, 2013). The study therefore motivates for a system such as UDI that incorporates adjustments that are necessary to uphold the dignity of those with disabilities, giving them a sense of autonomy and independence. This study echoed the perspective and sentiments of Hewitt et al. (2018) that it is vital that HEIs evaluate the experiences of SWVDs in the context of his or her role as an independent learner. The university should consider whether SWVDs are capable of focusing on their own strengths and self-determination, which they have developed during their lives to be able to embrace

inclusive practice (Hewitt et al., 2018). It is the DSU that has exposed SWVDs to various aspects of campus life and not the institution as a whole.

It is apparent from students' utterances that the positive experiences of SWVDs are emanating from the DSU, when in fact it should be centred within the personal agency of the student and their reciprocal interaction with the university. This raises the question of how SWVDs are able to reach their greatest dream, which is to fully participate in society as equal citizens when in fact they are deprived of equality of opportunity and equitable access to resources. The university is refuting claims in Zalenski and Raspa (2006) that human beings develop once successfully merged in communal traditions. For the purposes of this study, communal traditions implies within the education domain.

f) Re-formatting

The university believes that it provides remote technical support for SWVDs requiring re-formatting to assist them when they experience technical challenges with their assistive software and devices (UKZN, 2021). The university claims that re-formatting academic material in accessible formats can be arranged upon request from SWVDs in a multitude of accessible formats conducive for use with screen-readers or screen magnification software, including Braille (UKZN, 2021). However, it is evident from Student J's response that only some academic and support staff fully understand the needs of SWVDs and as a result do not adequately accommodate their needs.

<Files\Audio Interview with Student J> - § 1 reference coded [0.43% Coverage]

Dr X refers me to Y to ask him to help me in every step so that I can't have a problem with my study. When I'm having a problem I just consult him every time.

This is supported in a study of the university's capacity to service SWDs by UKZN PhD, Shaikh (2017), who emphasized that the university's lack of staff hampered such service provision. With minimal full-time staff and the university offsetting this deficit by employing student assistants on fixed-term contracts directly impacted on the quality and adequacy of services for SWDs (Shaikh, 2017). This impacted those students requiring computer adaptive hardware and software used in the Disability Laboratories (Shaikh, 2017).

5.5.1.2 Online (current and previous thinking)

A sudden transition to online learning provoked by the COVID-19 moment left many SWVDs from rural communities feeling left behind as they faced challenges in accessing data; adequate network coverage; the requisite technology; and having to work in non-conducive environments to advance in their education (Subbiah, 2020). However it can be argued that this rapid transition to online learning platforms forced students to attain digital independence that will see them through university and place them on par with peers into mainstream societies (Subbiah, 2020).

<Files\Audio Interview with Student G> - § 1 reference coded [0.37% Coverage]

Student G: Something good is that we also get the notes on Moodle so that's fine, when I get left out I can still find the information, that's what is good.

<Files\Audio Interview with Student J> - § 1 reference coded [0.85% Coverage]

a positive moment is when I have to DO the online learning, that was very much appreciated to me. Because everything was just there on for me, I Don't have even any problem because I know how to control a lecture because I can see my notes in front of my laptop. Even if on a Zoom meeting, I know how to ask questions to the lecturer and then be comfortable in that site.

<Files\Audio Interview with Student O> - § 1 reference coded [0.88% Coverage]

So I was able to sometime they will explain us, they give us more information in terms of how to be how can I improve in being a good scientists. There is a lot of things, I also learned to use technology because my where I come from is a rural area, there's no technology but here at varsity I was able to use computers, laptops so I was able to get some technology.

Student respondents showed appreciation for online platforms as it contributed towards their independence. Students conveyed that online learning resources improved communication and reduced disability stigma as students were more comfortable to interact with lecturers through this learning platform.

Drawing from Pearson and Koppi's (2002) list of online learning benefits, Student G reflected positively on the availability of online learning resources that would otherwise have left him/her feeling left out. In addition, students were receptive to the exposure to online technologies as it improved their potential to access learning. This study promotes the adoption of flexible learning methods as outlined in UDI which correlates with Pearson and Koppi's (2002) observation that adopting flexible learning methods and online technologies increased the potential for widening learning for SWVDs from rural communities who may have been previously excluded.

5.5.1.3 Access Programme

The College of Humanities' Access Programme was the university's outreach to prospective SWVDs who came from disadvantaged educational backgrounds (schools unprepared to deal with university education). The access program is seen as an innovative alternative to identify candidates who have the potential to succeed at university (Access Programme, 2021). As such the purpose of the access programme was to familiarise SWVDs with the challenges of studying at a university.

<Files\Audio Interview with Student B> - § 2 references coded [1.01% Coverage]

Reference 1 - 0.20% Coverage

through the access programme, the extended curriculum programme, right.

Reference 2 - 0.81% Coverage

And that, that helped me a lot because it is really helped me allot I learned to write my essay structure, my essays and everything. So yeah, I'd say start starting at DSS4 is one of the positive things with a university where you actually get to understand and get used to the way the university operates.

The access programme created platforms for SWVDs to engage with the university community and equipped them in areas of academic and psycho-social skills (Access Programme, 2021). However, there is growing support for the claim in Marimuthu and Cheong (2014) that the system required to be re-designed and restructured to meet the demands of all. Subbiah (2020) added that a comprehensive level of disability services is essential in HEIs to acclimatise SWVDs to the university environment.

5.5.1.4 Achievement

It is shown in Student L's recollection of events in class that if supported, acknowledged and given opportunities within the classroom, one can achieve more than what is expected of them (Marimuthu & Cheong, 2015).

<Files\Audio Interview with Student L> - § 1 reference coded [0.93% Coverage]

So we wrote the test, we wrote a module. So what happened is, I happened to be the highest achiever on that test. So my, my highlight will be the time when the lecturer asked me to stand up so that everyone could see me and that he had to tell them that if you, you know if you are really struggling this is the guy to talk to. Yeah, I felt really to be a part of that class cos yeah, there were some people now who come to me or write me asking me about that.

This coincides with Maslow's suggestion that SWVDs required acknowledgement, approval and acceptance to feel a sense of belonging (McLeod, 2014). In addition, when this is achieved, SWVDs gain respect, esteem and status. Singh's (2017) study concerning SWVDs at UKZN revealed that belonging and inclusivity is significant at the 3rd level of the Hierarchy of Needs model as it encouraged SWVDs to gain power and control over their achievement and their lives.

5.5.1.5 Adaptive Software

Student respondent Q took comfort from the fact that some provisions have been made to assist him/her to access learning materials at university. However, the question remains whether the university is adequately equipped to accommodate a range of visually-impaired students and conversely, if SWVDs coming to university are equipped to make use of technology and digital platforms available at the university. Subbiah (2020) confirmed that the university, via the Disability Support Unit, provides a comprehensive support provisioned to SWVDs including reformatting services, scanning and reading devices, converting and editing academic material into accessible formats for electronic access to information.

<Files\\Audio Interview with Student Q> - § 1 reference coded [0.67% Coverage]

Okay, the good thing is that I have a computer with jaws, and in this also that's also I'm able to access Moodle. And I also have that thee Adobe Acrobat that I can read the, I can read PDF with. And I also can also able to retype, I'm able to go to student's central with my device so yeah.

Dutta (2013) agreed that steps towards making education inclusive requires embracing assistive technology and only those institutions open to the specific needs of SWVDs have the capacity to recognise the impact it has on their learning and social integration.

5.5.1.6 Certain Academics

Student E was satisfied as some academics valued and respected their students and understood that given the opportunity, SWVDs can achieve more than what is expected of them (Marimuthu & Cheong, 2014).

<Files\\Audio Interview with Student E> - § 1 reference coded [0.64% Coverage]

But the academic staff try their best especially in the explaining process of whatever course they about to deliver to provide the reasonable accommodation for students with visual disabilities.

Academic staff members need to set the stage for better performance by ensuring that SWVDs understand that they are no different from their sighted peers and can at times be more efficient in some activities than other mainstream students (Rajkonwar et al., 2015). The academic staff in this instance can subscribe to the universal design model. Under the principles of UDI, if a SWVD was not successful in class, the academic staff member assumes responsibility for not modifying the activities correctly and as such, will make the necessary adjustments to accommodate students to ensure flexibility in use (Haegele & Hodge, 2016).

5.5.1.7 Hearing versus Reading

Student N conveyed in his/her argument that due to visual impairment, he/she learns and comprehends more fluidly through oral discussion than by reading and therefore found it beneficial to work in groups, group studying or engaging in group-related activities. This proved that students are in favour of peer support groups, or what is commonly referred to as the buddy system.

<Files\Audio Interview with Student N>+- § 1 reference coded [2.07% Coverage]

Yeah, as I said, I usually learn with my hearing so if I hear something once its hard for me to remember these things because the other sense I learn with my because the other when I heard one sense it means the sense becoming more strong. My hearing sense is more stronger than the eye sense so I'm able to obtain things like as I hear them faster than as I read on my own. So when I read on my own cos I do read on my own sometimes and I and the other thing I usually do which is positive for me is to study in a group so we can discuss being with my other peers and I can explain to them while explaining I learn more, which is what I would do in high school. So this is a positive experience I can tell you, I did get while I was studying

Previously research by Benson and Dundis (2003) confirmed that organisational design conformed to a participatory approach which allowed for more input in the decision-making process and exposed SWVDs to opportunities to participate in new and different groups, expanding the sense of belonging (Maslow, 1943/54) amongst students and availing opportunities to students to work with and become familiar with other students. In recent studies, it was highlighted that the buddy system approach provided instructional assistance, enhanced safety and fostered inclusion by increasing interaction with all students when they participated in peer buddy programmes (Green Teacher, 2013; Foster, 2011)

5.5.2 Challenges and Negative Experiences

This sub-theme examined the challenges and negative experiences of students with visual disabilities in the classroom. The previous section showed a minority of students who expressed having a positive experience at the university. However, the negative experiences of many SWVDs far outweigh the positives. There were a plethora of findings and each is classified below.

5.5.2.1 Attitude

There seems to be a dire need for changes in the negative attitudes of lecturers in the classroom that demand more positive beliefs and greater commitment from the academics and professionals, as well as students without disabilities (Marimuthu & Cheong, 2015).

a) Lecturers

Contrary to UDI, the general observation at the university is that there are some minor accommodations for SWVDs in their class and it is expected that they just “fit in” (Haegle & Hodge, 2016:pg. 200). Students D and F conveyed that lecturers are intolerant, do not understand visual impairment and do not want to listen. The locus of the problems is centred directly on the SWVDs and the lecturer assumes that it is the students’ visual impairment that has led to the problem. The difficulty in explaining eye conditions each time they required the necessary accommodations is evident in the following dialogues of SWVDs:

<Files\Audio Interview with Student D> - § 1 reference coded [1.34% Coverage]

And the negative experience that I've had has been when a lecturer does not understand my type of disability or does yes. And does not what's this or doesn't understand, and doesn't want to listen to me when i say something doesn't believe that what I'm saying is true. Has it been negative, but having to disclose to tell every, every lecture about my, my disability, it's been very negative and something I'd prefer to keep to myself.

<Files\Audio Interview with Student F> - § 1 reference coded [0.74% Coverage]

:Um, when a situation like that arises I needed to I do have to explain to them however, the only other way I have to explain my eye condition and reasons for me requiring reasonable accommodation is when I'm actually asking for these reasonable accommodations provision of extra time.

The entrenched attitudes of lecturers have led to unwillingness to change activities that have worked for years for many students (Haegle & Hodge, 2016). In hindsight, it appears unfair

to mainstream students to make adjustments merely to accommodate SWVDs in the classroom (Haegele & Hodge, 2016). It is such contentious attitudes that cause students to avoid disclosing their disability, evident in both Student D and F's explanation.

- **Lack of Awareness**

Students are aware of their intellectual capabilities, but feel that their visual impairment distracts tutors from recognising their abilities. It is apparent from students' conversations that lecturers are not aware of how visual impairment affects student interaction and participation in the classroom. Furthermore, the lack of awareness and understanding, especially in subjects like mathematics, left some students confused. Clearly, some academics and support staff do not fully understand the needs of SWVDs, thereby creating barriers to learning in the classroom.

<Files\Audio Interview with Student E> - § 1 reference coded [1.28% Coverage]

The intellectual capabilities are there but they are terribly distracted by the physical, the visual inability for instance um last year at the beginning of the year the tutor read out a paragraph from the screen, okay a problem question and expected us to be able to engage on that and they completely left out me and other people with visual disabilities cos we cannot read.

<Files\Audio Interview with Student K> - § 2 references coded [0.33% Coverage]

*Reference 2 - 0.13% Coverage
But I still feel even afterwards they still tend to forget.*

<Files\Audio Interview with Student L> - § 1 reference coded [1.11% Coverage]

There was a lecturer when I was doing, ok the mathematics, basic numeracy. So this lecturer will just tell you, you have to take this this and this, when they tell you about this and this and this, it's written on the box but I can't 'see it, so it makes no sense to me for someone with visual disability. If they can tell me that you need to take the square root of this and add to the square root of this, but instead the lecturer will tell you, you have to take this and this and put together and subtract this, it's really, really confusing.

Lecturers tend to forget the level of diversity that exists in the classroom and that visual impairments present a range of unique educational needs (Rahman, 2019). For instance, SWVDs cannot be expected to read and engage in the lecture as they cannot read from slides on the projector screen. Students with visual disabilities require specialised adaptations to achieve this, such as course materials, screen-reading software or magnifiers. The approach to such challenges would involve awareness programmes and workshops for all academics and support staff that are designed to address attitudinal and informational barriers regarding

issues concerning SWDs as they continue to experience prejudice and discrimination in the classroom (Shaikh, 2017).

- **Lack of Accommodation**

Mainstream students seem to be under the misconception that accommodating SWVDs is an unfair advantage that these received over other students. As such, Student L felt he/she did not get an extension for an assignment despite explaining his/her disability to the lecturer. Furthermore, students are gravely disadvantaged due to misconceptions about special arrangements such as re-formatting to read using adapted software. Due to a serious lack of understanding and awareness, it was construed that SWVDs got special treatment and had to face the consequences for the late submission of an assignment equivalent to sighted students.

<Files\Audio Interview with Student L> - § 3 references coded [3.45% Coverage]

Reference 1 - 0.50% Coverage

Alright, the one particular incident that I remember is when the lecturer denied me an extension for an assignment. Because I told her that I had problems acquiring that material for that assignment I was doing, I had to do some sort of research.

Reference 2 - 1.89% Coverage

So I had to find those documents and reformat them, so I can read them and then start with my assignment. So the time went by so quickly that when I go to her on the final day of the submission, I told her that I had trouble acquiring the material for, for, for my assignment. And she told me that it was not accepted as the other students are doing assignment on time and me, I think, deserves special treatment. And I tried to say that no, it's not special treatment I must be supported, because I'm not, I'm not like them. They get the material and they do the assignment. So me, I had to find the material and change and reformatted the document, so I can start reading. And that's totally she couldn't really understand that. I had to accept that, whenever I would submit my assignment will be reduced, because they had a reduction for a certain time when your assignment was overdue, the marks will be reduced on the assignment.

Reference 3 - 1.07% Coverage

There's this thing of lecturers where they start to point at an image, an image that they would not describe to you as a visually impaired student they just won't tell you what is that image they are pointing at, they just illustrate with hands and use the PowerPoint presentation. You will find that you do not have enough information when you get out of class because the lecturer was just pointing it out. They will just illustrate with those PowerPoint presentations.

Where it is believed that SWVDS were unfairly given “special treatment” due to the nature of their disability, this promoted an “outsider status” (Kasiram & Subrayen, 2013: pg. 71). The exposition in the above argument brings forth an important awareness of existing problems of

SWVDs in the classroom. This includes lecturers pointing at images on a PowerPoint presentation and not describing to the SWVD what the image actually is. This totally excludes SWVDs from participating and is not in line with inclusive practices in the classroom.

Findings in Zhang et al. (2009) indicated that staff member attitudes and beliefs have a direct influence on the provision of reasonable accommodations. This was supported in Madriaga, Hanson, Kay and Walker (2011), where it was explained that students showed a sense of resentment towards students who receive disability support and accommodations in their learning and assessment. This study revealed that the resentment toward SWVDs was based on what students believed to be equity and fairness which was premised upon the notion that ‘everyone is the same’, or ‘normal’ (Madriaga et al., 2011:pg. 914). Furthermore, the academic staff should accept constructive feedback on the curriculum outcomes to understand what modifications or accommodations work best for the SWVDs.

- **Lack of Care, Understanding and Patience with SWVDs in the Classroom**

Students elaborated that not all lecturers mind having SWVDs in their classroom, although others do not really care and do not treat them on an equal level with sighted students. However, Student K is adamant that asking lecturers for assistance is not helpful as they will ignore you. Student J attributed this to a lack of awareness, providing inadequate accommodation and thinking that the little they do is good enough. This may include “quick fix” solutions where lecturers instruct SWVDs to sit in front of the class ignorant of the fact that visual impairment has an array of variations in the ability to see.

<Files\Audio Interview with Student J> - § 1 reference coded [0.51% Coverage]

So when you coming to the venue it is up to you that you have to start again and consult your lecturer than tell him about the situation. And other lecturers they don't even mind about that and others don't care about you.

<Files\Audio Interview with Student K> - § 1 reference coded [0.29% Coverage]

Well, it's not nice. It's really not nice. You know you can't say anything if you're trying to ask of course, they will ignore you.

<Files\Audio Interview with Student J> - § 2 references coded [1.70% Coverage]

Reference 2 - 1.20% Coverage

When they know your situation it's just that they then they treat you equal, they don't.... it's just they were not aware. Even if they didn't start the lectures, there are a few that they have to attend your situation. Most of them they don't care about the situation they even they say this, if you don't see the in the in the screen you have to come in front and then be in front of the.... sit in front of the desk, only to find that is it in small way, not in big ways they don't have to display it on, on bigger words.

<Files\Audio Interview with Student B> - § 1 reference coded [1.13% Coverage]

I think it is for the lecturers to be patient with us, you know, they they they have this mentality that we should we should have this belief in our head that we will we would like be like every other student, which is not, which is not true. We need we need extra ordinary attention. If they also understood that, I think it should be a lot more easier. And it is not all of them that put the same effort to ensure that we are also accommodated.

<Files\Audio Interview with Student L> - § 1 reference coded [0.38% Coverage]

And once you try to explain that to the lecturer, others don't give you even an extension, if you really need to make a submission. So, yeah, there's still a long way to go in that regard.

<Files\Audio Interview with Student K> - § 1 reference coded [0.29% Coverage]

And don't you feel that, that is just you know, being ignorant and you know, not wanting to you know, understand your situation.

Students concur that lecturers should be patient with them, but are doubtful that such change will be effected any time soon. Students feel that this was due to ignorance and a lack of interest in wanting to know or understand the situation SWVDs find themselves in at a mainstream university.

Lecturers should be cognisant that SWVDs want to feel accepted and like-they-belong like other students and that “othering” is painful and discriminatory (Kasiram& Subrayen, 2013: pg. 68). The needs of SWVDs are similar to sighted students and it is essential that lecturers have a positive attitude that will assist in developing a positive self-concept, belonging and positive attitudes in the learner (Rahman, 2019).

- **Access Issues, Lack of Interest, Interaction and Continuation**

Without appropriate accommodations, SWVDs will fall behind and perform poorly due to access issues, poor engagement with the lecturer, lack of focus and failure to concentrate in the classroom. Student respondent J felt that despite continuously reminding lecturers about his/her concerns regarding their visual impairment, lecturers did not care because they did not make any follow-ups. It was concluded that it will be beneficial to all students if lecturers collaboratively engaged with SWVDs and ensured that all students have equal access to the course content.

<Files\Audio Interview with Student M> - § 1 reference coded [0.73% Coverage]

And be able to engage in a very difficult many people are suffering from the side So; everyone is going to sit in the first row, so I end up sitting in the middle row, or something like that and I can't concentrate. I can't focus in the classroom; I can't hear what the lecturer is saying, what he is talking about.

<Files\Audio Interview with Student J> - § 1 reference coded [0.94% Coverage]

Oh negativity is just that every time I have to remind each and every lecturer about my concerns and others I just leave them like that and do my work so that I.... because they didn't follow up or make follow ups. Maybe out of five lectures in the semester, only two lectures that they have that consult me about my situation. But other three they do not care about my situation they take me as a normal person.

<Files\Audio Interview with Student B> - § 1 reference coded [0.46% Coverage]

so if every lecturer put, put the same effort to ensure that their students can access all the content and everything. I think that'd be better for us as also. Okay. All right. And then

Students with visual impairment have to continuously remind lecturers about their disabilities in order to access appropriate accommodations. This demotivated them because they want to fit in with other students and not feel stigmatised and isolated from other students in the classroom (Parashar et al., 2008).

It is not solely the responsibility of SWVDs who need to become familiar with a mainstream university, but also involves sensitising mainstream students towards SWVDs and educating them about the different forms of disability within their classroom and at the university at large. Institutions of HE need to be mindful that SWVDs will ultimately become future citizens within their society. Therefore, Marimuthu and Cheong (2015) insist that inclusive education be conducted with the intention of merging SWVDs into society, which will ignite paradigm shifts in current thinking.

b) The Effects of Exclusion

The effects of exclusion included the following:

- **Anxiety**

Student A was overcome with anxiety when he/she arrived for a test and found no accommodations were made, despite informing the lecturer about her/his blindness in good time.

<Files\\Audio Interview with Student A> - § 1 reference coded [0.70% Coverage]

Reference 1 - 0.70% Coverage

I was worried - I was worried at first, because if this was a formal one. It would have affected my academics, and it also, because I did give her, inform her on time that I'm here as a student with blindness. And everything was missing on the paper that I provided. It was hurtful and I was really worried because I thought of my academic performance at the time.

Madriaga et al. (2011) showed that Student A's fears are not unfounded in that SWVDs who do not receive disability support under-perform. In addition, Parashar et al. (2008) affirmed that attitudes toward SWVDs are important because SWVDs incorporate perceptions of disability in structuring self-identity, which in turn influences psychological well-being (Maslow). Negative attitudes lead to negative expectations of SWVDs, resulting in their marginalisation, isolation and victimisation (Parashar et al., 2008).

- **Convenient Referral**

The perception of students is that the university space is not accommodating towards SWVDs. Madriaga et al. (2011) confirmed that it is due to the negative attitudes of staff and students and their perceptions that SWVDs feel less capable intellectually. This is discomforting to SWVDs, causing them to feel like they do not belong, promoting low self-esteem and a reluctance to disclose support needs. Student L's voice attests to the fact that SWVDs continue to be excluded at university.

Madriaga et al. (2011) and Benson and Dundis (2003) agreed that the most effective way to alter attitudes favourably is to combine instructional design and direct contact with SWVDs. Sighted students have not been exposed to SWVDs and are therefore under the misconception that students with visual impairment cannot use a laptop and therefore feel uncomfortable around them. This was evident in the negative sentiments expressed by Student A, that his/her contributions and opinions were not taken into consideration, leaving them feeling left out and discouraged to participate in the group project. Such feelings caused Student A to withdraw from the group project and opt to tackle the project on their own.

<Files\\Audio Interview with Student L> - § 1 reference coded [1.01% Coverage]

Reference 1 - 1.01% Coverage

Well, what I can say on that, it's a lot to, we will have to adapt to a lot of, to a lot of activities in the university space. Because it's not really accommodative towards students with visual disability, whenever you have a problem they will always refer you to that disability unit, whenever you have a problem, they will tell you, they will refer you to the disability unit. So, that, that's helped us to adapt with disabilities who sometimes come with our own improvisation towards some activity.

<Files\Audio Interview with Student A> - § 1 reference coded [1.94% Coverage]

Reference 1 - 1.94% Coverage

I remember this one incident when we were in a group of 5, the lecturer gave each and every one of us a task to do. So we had to divide ourselves accordingly and I volunteered to type the whole, to type everything basically. I don't know whether, okay I don't know if they were really comfortable with me with handling a laptop. They weren't really convinced that I am able to because of that I ended up doing absolutely nothing. I thought that maybe it was because I didn't, they didn't believe that I was able to use a laptop but when my contribution and opinion to the project weren't even considered, then I realised that I'm not really valued here. And in a way it made me feel like I don't belong to an extend where I went to a lecturer and asked to do the project myself. Unfortunately, it was a group work, I just had to let it go and see what happens and when the marks came it, to me it was an embarrassment, because I feel like if my contribution was considered maybe we could have done better.

<Files\Audio Interview with Student E> - § 1 reference coded [0.79% Coverage]

Reference 1 - 0.79% Coverage

And excluding people with visual difficulties, so as much as academics but I really think that training in teaching and learning pedagogies and so on, will be very, very helpful for them to be exposed to inclusive education.

<Files\Audio Interview with Student L> - § 2 references coded [2.25% Coverage]

Reference 1 - 1.49% Coverage

So when I arrive I had someone who was helping me my personal assistant, with navigation on the campus, there were times where you will feel like, it's not you, a student who's learning, you will find some lecturer instructing your, your personal assistants as to what must be done. While they should instruct you as the student. His role was to help me to navigate around the campus but sometimes I used to find that he was the one who was being instructed to DO this and that, and while my problem is only in the eyes, they Don't get it, they don't get it that my problem is only the sight, not anything else. No. There were some instances where you feel like you're left out on your own program but you are left out. But you are left.

Student A believed that their contribution could have helped the group accomplish their set goals and even do better. However, sighted students do not understand and have no faith in SWVDs' self-efficacy (Blackman & Maynard, 2008). The culture that UDI promotes is one where all people are equally valued and everyone feels accepted, celebrating the notion of inclusion (Marimuthu & Cheong, 2015). Parashar et al. (2008) pointed out that SWVDs who are de-valued will face stigmatising attitudes that result in segregation and discrimination. As such, Marimuthu and Cheong (2015) maintain that inclusion and participation are necessary for human dignity and the appreciation of human rights within a society. Drawing from the arguments, students recommended that lecturers be trained in inclusive teaching and learning pedagogies.

The lack of properly trained lecturers in dealing with learning in a diverse classroom resulted in SWVDs not receiving appropriately adapted accommodations. Therefore, Marimuthu and Cheong (2015) recommended that it was important for teacher training programs to handle learning in a diverse classroom. Campbell et al. (2003) concurred that to develop positive attitudes required enhancing the competence and readiness of regular lecturers in teaching and learning and that suggested this process started earlier in their teaching career to encourage positive attitudes towards educating SWVDs.

Lecturers need to comprehend that inclusion is about diversity, changes in attitudes and instructional methods of teaching (Marimuthu & Cheong, 2015). Furthermore, teaching a class of diverse learners required knowledge, skill, practice and values including acceptance, confidence, tolerance and commitment. The lack of these, result in SWVDs feeling misunderstood and taken for granted by other students and lecturers.

Students expressed that they preferred lecturers and other students speaking directly to them rather than conversing with their personal assistant. This points to another form of exclusion that requires the understanding of the role personal assistants and sighted companions play with regards to SWVDs. New Jersey Council of the Blind (2020) explained that being informed removes the stigma of blindness if simple points of courtesy are observed such as, when addressing a SWVD, talk directly to the student and not the sighted companion.

c) Reasonable Accommodation and Sarcastic Staff and Students

Student respondents voiced their opinions regarding the lack of continuity and how lecturers forget and do not follow through after being provided with written notification informing him/her about students' disability status. In addition, students alleged that lecturers expressed exasperation, indicating that it was not in line with their job to assist SWVDs.

Students with visual disabilities are accommodated for tests and exams in a separate venue and they receive standard extra time to complete their test and exams. However, SWVDs believed that such accommodations are viewed with scepticism by their classmates. Students with visual disabilities are also reluctant to take advantage of the additional time offered as the extended time allowance makes them feel awkward (Vickerman & Blundell, 2010). Students revealed in their conversations that when they ask lecturers for

accommodations, they are shunned due to a lack of awareness and training on how to respond to a diversity of students (Vickerman & Blundell, 2010). Student respondents attest to the fact that lecturers do not put their needs first and believed that the locus of the problem **laid** in their visual impairment, which led to them being excluded from the examination.

Universal Design of Instruction Principle Five allows the tolerance for error where the design caters for and minimises the adverse consequences of accidental or unintended actions. Clearly this was not orchestrated in the scenario portrayed by Student F. Adolescent students mocked and annoyed Student M who gave insight into the sheer unpleasantness of how it feels to be the recipient of such mockery, which ultimately led to a bad experience at the onset of their tertiary education. On the contrary, good experiences are dependent on the attitudes of staff and other students, but this is not the case at the university, evident in Student A's experience when they got lost (Vickerman & Blundell, 2010).

<Files\Audio Interview with Student A> - § 2 references coded [2.68% Coverage]

Reference 2 - 1.67% Coverage

So I did, present the letter to her. She did, and the second time I came to her class we were given a quiz. It was not a formal kind of test, it was to test our knowledge how we really understand the module everything so when I did inform her, because at the time, I didn't have a human assistance, human aid, who will be able to, to maybe write down the answers for me. So I needed help in that department because I hadn't gotten my my laptop at the time. So when it happened, I lift my hand to ask for recognition, when she came over I, I did explain everything. And it, well, what she did is that she's not it's not her job to assist me with writing the answer, because only the only thing I asked was that I, I should be given maybe someone or some time to have someone over to write the answers down for me. And she's just got it all as if it was a problem.

<Files\Audio Interview with Student F> - § 1 reference coded [2.24% Coverage]

Reference 1 - 2.24% Coverage

In fact I emailed three of them, the course co-ordinator, the lecturer and the administrator and I said this is the problem I am so and so and I have vision impairment and I read this incorrectly. I am not a day later, I'm only a few minutes later but please may I attempt my assessment now, and I was refused and it was a major issue and I had ended writing the agrotat and placed my marking or the passing of that module in jeopardy, due to a small error of reading PM instead of AM. And that is the major issue I am having with my eyesight at the moment, I tend to see things incorrectly, and that is due to eye strain and eye fatigue and I never had this issue prior to being in UKZN. But due to this as I said my eye condition has the potential of getting worse and this is one of the things I mentioned to them my eyesight is getting worse but um it was not accommodated.

<Files\Audio Interview with Student M> - § 1 reference coded [1.42% Coverage]

Reference 1 - 1.42% Coverage

The negative experience is when I'm asked about my condition and I need to explain to people because some people will ask me what is the problem with your eyes? Because it's nice, it's clean. You wear

glasses for fun or? In my first year I was not comfortable to go to class because learners will ask me like that. Am I able to see these? Oh, I don't. You know students? Some were just plain ask it again, are you able to see this. Are you able to see this? Some will just cover my eyes so I can't see with my right eyes. So the experience for my first year isn't that nice? It wasn't nice. It was a bad experience.

<Files\Audio Interview with Student A> - § 3 references coded [1.45% Coverage]

Reference 1 - 0.27% Coverage

It has to be, not being able to be okay, I'll say the interaction with students and other lecturers were not so pleasant at times and I think,

So I did just that going to class, I was using my cane and on the way I somehow took a wrong turn and forgot the way, and I got lost when I so I heard voice coming towards me and I tried to stop one of them. And, the one stopped to ask what was wrong I think there was 2 ladies coming towards me, I tried to stop them. Yes, and one stop to ask what is wrong, the other one said, she said we don't talk to blind people. She pulled her and they left me there.

Students revealed underlying invisible barriers such as stigmatisation, misconception and negative societal attitudes of staff and students that remain due to low levels of awareness which led to segregation and discrimination (Parashar et al., 2008). Student A felt devalued after facing such stigmatising attitudes. Other students did not understand how to interact with the SWVDs in order to assist them. Student L disclosed that reluctance to assist the SWVDs centred on the attitudes of other students. To change attitudes towards inclusion, Campbell et al. (2003) suggested that staff and students required becoming more at ease with persons with disabilities in general.

5.5.2.2 Course Content

Tremendous challenges were experienced in relation to course content, as outlined below.

a) Projector Slides, Time-Consuming and Access

In the following responses, participants voiced their feelings about not having access to the course content and notes pertaining to the lecture in time to be able to fully participate in the lecture. As a result, students experienced difficulty in the classroom as they are unable to relate to the course content to fully engage in the lesson. It was not only time-consuming to make arrangements to acquire the relevant content and notes, but also difficult to keep up-to-date with work in progress, which required additional effort on the part of SWVDs.

<Files\Audio Interview with Student A> - § 2 references coded [0.92% Coverage]

Reference 1 - 0.48% Coverage

we cannot umh the contents and the notes at that particular time when interacting with the lecturer and every one and that has been one of the most difficult parts. Is that I can't, I can't access the information that is given at that time.

The students responded that they felt incapacitated and unable to participate at all in the classroom until after the lecture. Students indicated that negative experiences in the classroom arose at the first-year level as it was difficult to access the university's online system (Moodle). Students alleged that challenges included SWVDs' lack of technological skills at the first-year level and time constraints with regard to familiarising oneself with the current online learning system. Some SWVDs lost up to two months familiarising themselves with the current learning system. In addition, SWVDs do not have the comfort of going back to their residences after class to start engaging with the work at hand. Instead, they would have to go to the DSU first to access notes, which proved to be time-consuming.

<Files\Audio Interview with Student G> - § 1 reference coded [0.40% Coverage]

Reference 1 - 0.40% Coverage

Oh, I, yoh, I can't explain it, but it's more like when I'm in the class, I'm at a standstill, I don't do nothing, I just wait for the class to end so I can do the work.

<Files\Audio Interview with Student J> - § 1 reference coded [1.44% Coverage]

Reference 1 - 1.44% Coverage

I have negatively impacted for my first four months but when we started the online learning there is no problem, because I just put my laptop in front of me, every time in front of me and the problem is that if you are first year student, you don't know how to access Moodle. Then when you come to your room even though the notes are there on Moodle you have to start to read each and everything about technology. Then after a month or two then you aware where to get then notes, that's the problem, that's maybe affect the people with visual disability. It takes two or three months to understand how to cope with your study.

<Files\Audio Interview with Student L> - § 1 reference coded [0.52% Coverage]

Reference 1 - 0.52% Coverage

Alright, yeah, that feeling when you would have to leave a classroom to go to your res, but I wouldn't have to go to my res. And I have to go to the disability unit, because you know my notes have to be accessed from there. That's really time-consuming.

Although the DSU provided reformatting services, time constraints to use this service resulted in setbacks with respect to other students in the classroom. It was found that uploaded notes were incompatible with the available software(JAWS) meant to assist them read the notes. In the following responses, students revealed that not having accessed the necessary course content and notes placed them at a disadvantage as it hindered interaction

with other students in the classroom who usually did not understand how they operated. Students agreed that not having access to the relevant slides disadvantaged SWVDs, regardless of accommodations meant to ease access such as sitting in the front row of the classroom. Students complained that accessing computer LANs was also time-consuming due to where the LANs were situated in relation to the Colleges.

<Files\Audio Interview with Student A> - § 1 reference coded [0.56% Coverage]

Reference 1 - 0.56% Coverage

And in all my lectures It's been really hard for me to access the notes and everything and as much as that disability unit office do actually help us reformat some slides provided in class, it takes a bit longer and it puts us, sets us back a little bit from other students because we cannot,

<Files\Audio Interview with Student C> - § 2 references coded [0.57% Coverage]

Reference 1 - 0.19% Coverage

No, no. The notes that they upload, jaws does not read them.

<Files\Audio Interview with Student E> - § 1 reference coded [1.06% Coverage]

Reference 1 - 1.06% Coverage

Equality service regardless of bad disciplines, so if you didn't have access to the slide beforehand you are in trouble cos you can't have notes, make notes and so on, regardless even if you sit at the front or the back. If you got challenges you are not going to be able to read what's on the PowerPoint presentation.

<Files\Audio Interview with Student O> - § 1 reference coded [0.58% Coverage]

Reference 1 - 0.58% Coverage

And another bad experience was if I'm going to the LAN, the colleges are not as close as much as I need so they are not close enough for me to see so I was really struggling, I ended up wasting a lot of time trying, read at least one page.

It is understood from the prevailing arguments that if technology promoted inclusivity, then technology design should take into account accessibility and usability (Ngubane-Mokiwa, 2016). Dutta (2013) stated that to consider improvements, educators could test the feasibility of a classroom in advance ensuring that:

- The level of lighting has been adapted for the SWVD, and
- ICT devices are available and accessible.

Simple adjustment to formats can improve on time constraints and access to course content adhering to UDI Principle Three that using the simplest formats can help SWVDs. It therefore, becomes mandatory that support staff have the time to modify materials to include, larger print or a print and a digital copy, as well as other modifications to course materials

well in advance ensuring that SWVDs are on par with other students in the classroom, facilitating equal involvement and participation (Dutta, 2013). It is imperative that applied technology open doors to the specific needs of SWVDs and have the capacity to recognise the impact it will have on their learning, classroom interaction and ultimate societal integration (Dutta, 2013).

b) Hard to Read Font /Graphics and Online

Fonts and graphics that were difficult to read and interpret included:

- **Graphs**

According to the students interviewed, it appears that SWVDs are not well supported in the classroom due to deficiencies in lecturer preparation skills for inclusive education practice. Students with visual disabilities grapple with graphical representations and photographs that cannot be re-formatted and applied to the JAWS software to facilitate reading for SWVDs. Student L felt that lecturers were not aware of SWVDs in the classroom as they were not adapting course content to accommodate their needs. Furthermore, Student L complained that this limited the choices available to them with regard to appropriate module selection.

<Files\Audio Interview with Student A> - § 1 reference coded [0.83% Coverage]

Reference 1 - 0.83% Coverage

But, I do sometimes find it a bit difficult because there are maybe there's a graph, that we need to study or a photo of some sort, and if I do take it to the disability unit for formatting it's impossible to format a picture or a graph of any sort for JAWS to read for me. What they would do, they would say I have to, I have to refer to the lecturer to explain it and with that it's, it's time consuming for me to go back and forth.

<Files\Audio Interview with Student L> - § 2 references coded [0.95% Coverage]

Reference 1 - 0.63% Coverage

Well, most of my modules are notes so you can find the lecturer is just eh, is just elaborating on some points so the problem I experienced is whenever there is graphical information that needs to be aware of and students with visual impairment, you won't have that full picture of that graphical information.

Reference 2 - 0.32% Coverage

And, it's influencing our choices with students' visual impairment because you just can't take modules like economics because there's lots of graphics there.

Kasiram and Subrayen (2013) agreed that SWVDs were often denied entry to their choice of study as the university did not fully understand how they would cope in careers such as economics that applied the understanding of graphs. Inaccessibility of graphs, photographs, maps and video content often challenges SWVDs. Ngubane-Mokiwa (2016) suggested that to overcoming these challenges required graphical and similar informational content being accompanied by textual descriptions to enable SWVDs to understand what the contextual formats comprised of, as well as find compatible assistive devices to facilitate learning. The reinforcement of inclusive educational practice required designing any online learning platforms in accordance with ongoing testing and re-testing of the platform by SWVDs (Ngubane-Mokiwa, 2016).

- **Fonts**

Students disapproved of the use of small font sizes as it discouraged attendance. Students with visual disabilities are disadvantaged when they do not receive notes in the correct font size. Although lecturers are informed they are not adapting classroom materials and procedures to accommodate the needs of SWVDs, Student P confessed that it was very challenging when lecturers delivered their lesson in small fonts as it was difficult to see even when wearing spectacles. Similarly, students shared concerns that some pedagogies used in teaching and learning were outdated due to the lack of new and creative educational designs.

<Files\Audio Interview with Student D> - § 2 references coded [1.42% Coverage]

It's more, especially the font, the font size that it is used in our notes. Uh, the font size that is used when teaching, delivering the lesson that they use. So that's the problem that I have when I cannot see the font is too small.

<Files\Audio Interview with Student P> - § 1 reference coded [0.74% Coverage]

Reference 1 - 0.74% Coverage

Mostly, the lecture notes are written in a very small font, I think, I think it's eleven that to mostly the PDF is a very small font. So that's challenging. It's very challenging to follow, and I end up getting lazy to even read because too small even if I'm wearing the spectacles.

<Files\Audio Interview with Student E> - § 1 reference coded [1.10% Coverage]

Reference 1 - 1.10% Coverage

I think it's it's consciousness number one, and also accepting that that some pedagogies used in the teaching and learning are outdated, so so there is lack of creativity of new pedagogies that are more inclusive, so for instance the one that I've just mentioned on reading from the screen, copying up, it's outdated, completely outdated.

Tomozii and Topală (2014) supported the debate that teaching and learning were outdated due to the lack of new and creative educational designs such as UDI, which this study tries to promote. As such, people need to be prepared to adapt to change and opportunities in almost every major sector of their lives, including higher education because the education designed previously does not meet the present requirements of the diversity of students it supports today.

c) Reliance and Practicals/ Learning Activities

Student O felt that some activities and practicals were not meant for SWVDs as it delayed him/her and made them reliant on the assistance of other students, such as when trying to attain accurate measurements in chemistry. In addition, Student J felt that similar consequences arose when it became difficult to see notes displayed on the screen projectors during the study time:

<Files\Audio Interview with Student O> - § 1 reference coded [0.77% Coverage]

Reference 1 - 0.77% Coverage

Number one is that when you are at the university with a disability some activities are hard so for example when you are doing chemistry and doing measurement sometime I will waste more time trying to measure to do correct measurement with a burette. so some activities are really not for students with disabilities.

<Files\Audio Interview with Student J> - § 1 reference coded [0.63% Coverage]

Reference 1 - 0.63% Coverage

So, in other times you become, oh, in other times you get late it is harder on you to copy notes with your studies because you have to DO it on your own or ask your classmates to help you so that you can see what is displayed on the screen projectors during the study time.

d) School to University

One of the greatest challenges SWVDs face is that when they are in school, they are well catered for in terms of notes and content. However, students found that the challenge at university was that they had to fend for themselves because the university was not adequately equipped nor did they understand how to effectively meet the needs of SWVDS.

<Files\\Audio Interview with Student G> - § 2 references coded [1.10% Coverage]

Reference 1 - 0.69% Coverage

So the difficulty, so the difficult thing is the school I went to was a school that catered for visually impaired people, so we were given notes, we were given all the materials were given to us and when I come to university I have to do it myself. So that was one of the biggest challenges.

Reference 2 - 0.41% Coverage

From the school they understood when I said can you please increase the font they understand why I want the font to be increased, or can you please, they understood our needs.

e) Career Choices Limited

One would expect that SWVDs are sporadically distributed throughout all colleges at the university based on their career choices. However, SWVDs revealed that they have a limited choice and are confined mainly to the College of Humanities (Shaikh, 2017). Student respondent L felt anxious to consider avenues that were not explored by SWVDs previously, but felt limited in the choices available and was afraid that modules that were not attempted by other SWVDs would not incorporate inclusive pedagogies and will exclude him/her, resulting in him/her not passing that module.

<Files\\Audio Interview with Student L> - § 3 references coded [2.21% Coverage]

Reference 1 - 0.86% Coverage

Yeah, it does a lot, you find that as a student with disabilities we will move towards same career choices because we are afraid that if we take something that has never been done before by a student with visual impairment, you will have a lot of problems, cos they won't understand they will just tell you maps, maps that you won't see. Hey, there will be a lot of stuff that will be go over you and you won't be aware of it.

Reference 2 - 0.72% Coverage

But I find that when I get to varsity they advised me even those other students who were, who been at the varsity for years. They told that you won't survive to those modules because really what is happening there is really, is really exclusive of students of visual impairment cos yeah. So I find that our choices are really limited on that regard.

Reference 3 - 0.63% Coverage

Well I won't lie there, there were lecturers or advisors who advised me against any module but I find that I can trust my fellow students more than lecturers because lecturer want you to register for the modules that they perceive you are ready for it and they just do what they normally do with anyone else.

Lecturers tend to go with the norm and drive SWVDs toward modules that they perceive visually impaired students are capable of doing. As a result Student respondent L displayed less confidence in the advice of lecturers than in fellow students. Subrayen and Suknunan (2019) supported this finding and alleged that SWVDS are coerced by lecturers into traditional instructional design for able-bodied students and are not considering the specialised support required by SWVDs for modules they choose to do.

5.5.2.3 Tests and Exams

The following was found in relation to tests and exams:

a) Preference to Write on Their Own

It is apparent that with appropriate systems in place, SWVDs are likely to attempt writing exams on their own. However, they explained that due to a lack of technological experience they are less confident to try. Students struggle to adapt to the current exam setup at the university as they are not familiar with the process. For instance, SWVDs are afforded the opportunity to respond to test/examination questions in an oral medium and are provided scribes for written responses. However, students are not confident and found it difficult to adjust to and advised against scribes at the first-year level. Students admitted that they are not comfortable with the current examination setup and recommended it be changed or improved upon to better accommodate SWVDs.

<Files\Audio Interview with Student A> - § 3 references coded [2.30% Coverage]

Reference 1 - 0.86% Coverage

With my, with the test and exams, again the disability unit is doing a great job. Although, my first year I did struggle because I wasn't really familiar with how to, because I couldn't use my lessons because what they used to do is, when we writing a test or exam, you either choose to write on your own or you would write on word using a computer with one person reading the question for you or they will write it for you while you say it out.

Reference 2 - 1.22% Coverage

You have one person reading the question for you or they will write it for you while you say the answer and at first because I wasn't really you know confident to use a computer at the time, so I chose to help me write the answers down for me as i say them. At first it was hectic because it was something I'm not used to, i haven't done before, but with time I got a bit confident. And, I think for first years' that

system is, it's not comfortable at all but I am also not sure what can be possible for to change that or improve that, so it has been really hard for me to adjust to, to adjust to a person writing the answers for me.

b) Cynicism

Mainstream students are inclined to believe that SWVDs receive special treatment when they receive a time concession for tests and exams. Accommodations to assist SWVDs are scorned at by mainstream students because it is seen as an unfair advantage. As a result of the cynical behaviour of mainstream students, SWVDs are reluctant to accept the available accommodations and do not disclose their disability.

<Files\\Audio Interview with Student L> - § 1 reference coded [1.21% Coverage]

Reference 1 - 1.2(1% Coverage)

So, well there's this perception that students won't see us at the exam date or the test date. They'll see us maybe at the following day, and they'll think that maybe we didn't write the exam or the test. Some other will tell you, you have special treatment good for you, you don't write test, and I'm like no we do write test, it's just that it's not in the venue where you write yours but we do write our tests in the similar form as you. But their perception maybe leaning towards that is we are being treated specially because we are always at the disability unit but it's nothing like that.

Subrayen and Suknunan (2019) found that respect for human diversity allowed an understanding of the way in which learning communities promoted human development and well-being, creating a safe space for disability disclosure, decision-making, respect and non-judgemental attitudes that can reduce the awkwardness that SWVDs feel in the mainstream classroom. Vickerman and Blundell (2010) explained that staff held feelings of anxiety with regard to changes in curriculum and assessment as they did not want to appear conferring an unfair advantage on SWVDs. Vickerman and Blundell (2010) claimed that this was due to:

- a lack of awareness for the need for reasonable adjustments;
- a lack of awareness of legislative requirements; and
- a lack of training on how to respond to diversity in learning, teaching and assessment.

5.5.2.4 Lecture Venue

The lecture venue per se was fraught with challenges.

a) Physical Access due to Difficulties with Full Venues and Poor Lighting

Mainstream students have not been considerate towards the diversity of students in their classroom. This is evident in how their behaviour is perceived by SWVDs. It was difficult to see from the back of the classroom. Therefore to get to the front, Student J had to arrive earlier than other students as failure to arrive earlier would result in there being no available seats in the front row for the SWVDs. Furthermore, other students are reluctant to move and allow for the SWVDs to get to their place in the classroom. In support of this, students confirmed that it is becoming a problem for SWVDs to find seats in the classroom. In addition, lecture venues are not equipped with proper lighting to accommodate SWVDs. Students felt lighting issues affected only SWVDs and not able-bodied students who are unaware of the difficulties SWVDs face on entering the classroom.

<Files\Audio Interview with Student J> - § 1 reference coded [0.51% Coverage]

Reference 1 - 0.51% Coverage

Some other time, you get the problem that when you enter the venue maybe you all entering the venue, others they don't aware of the situation. Maybe when you are going in you miss a step because you have to go properly.

<Files\Audio Interview with Student O> - § 1 reference coded [0.25% Coverage]

Reference 1 - 0.25% Coverage

Then in the classroom I have to try to be early than everyone so that I can get a place to be in front.

<Files\Audio Interview with Student L> - § 1 reference coded [0.75% Coverage]

Reference 1 - 0.75% Coverage

Alright, towards classroom challenge, there are sometimes a problem with, you find that when you arrive at a classroom, it's full now so you won't have space, you won't find the space to sit and unless there's someone who will help you to find a seat, you might find yourself standing and felling your way trying to find a space and yeah, that's becoming a problem, yeah.

<Files\Audio Interview with Student M> - § 2 references coded [0.16% Coverage]

Reference 1 - 0.11% Coverage

Sometimes it's too bright, yeah it's too bright. You need to dim them.

<Files\Audio Interview with Student P> - § 1 reference coded [0.46% Coverage]

Reference 1 - 0.46% Coverage

In the classroom the problem that I had, was um it's the lights, lights affects me sometimes. So I walk into a classroom where other students have no problem with the light.

Sighted students are not aware that even if SWVDs have residual vision, (low vision) receiving information through visual input will be limited (Salleh & Zainal, 2010). This hinders progression in the physical environment. In addition, students with visual disabilities do not want to draw attention to themselves as they experience social awkwardness, discomfort and stigma that prevent them from requesting adjustments to improve physical access (Vickerman & Blundell, 2010)

b) Lecture Venue versus Recording

Assistive devices used by SWVDs meant to improve access to course content, such as recorders used in lectures, proved to be futile. Student respondent F revealed several flaws with the recording of lectures, namely:

- The lecture room set-up is not conducive to record lectures;
- People talking in the surroundings obscures the recording;
- The movement of chairs is distracting;
- Lecturers are not consistently talking into the microphone so are inaudible when they talk while walking around;
- Trying to elaborate on concepts from an inconsistent recording caused SWVDs to miss out on the full explanation of concepts; and
- It is frustrating to fill in the gaps when trying to grasp what was said in the lecture.

<Files\Audio Interview with Student F> - § 1 reference coded [2.78% Coverage]

Reference 1 - 2.78% Coverage

So regarding one of the major issues that I had in the lecture room, was one, related to one of the accommodations that I received. So after sitting with my independence and immobility trainer, then it was established that I was able to get extra writing time, larger font size test and exam, and I was able to record in lectures. So in terms of recording in lectures, the way our lecture room are set up is so poor to recording in them, because when you record the lectures and you go home to read, to hear them and then try and establish the course content because that is where you get your learning done, because when you go home and try and listen to the lectures you hear the surroundings, people speaking, you hear the chairs moving, you hear the lecturers walking away from their mic go around the lecture room and try to elaborate a concepts and you cannot hear a thing, so you missed important concepts which eventually makes you what can I say? Suffer great sometimes because you missed out and you are trying to fill in the gaps of what was said in the lecture.

The preceding arguments attest to the fact that barriers remain regarding access to information and lack of awareness amongst staff and mainstream students. Good experiences of SWVDs are largely dependent on the attitudes, experiences and exposure of other students to SWVDs (Vickerman & Blundell, 2010). It can therefore be surmised that there is a greater need for coordinated approaches to support SWVDs due to many areas needing further attention.

5.5.3 Group Work

This section examines the challenges experienced in group work.

5.5.3.1 Exclusion

Exclusion was the main challenge in group work and was informed by the following:

a) Grouping SWVDs left some Students Feeling left out and De-valued

Students with visual disabilities felt ignored in groups as other students continued their conversation amongst themselves while they made their contribution to the group assignment. This resulted in them feeling left out, de-valued and excluded from the group. Student respondent L found that the group he was assigned to continued to make excuses that they were busy when he/she wanted to work on the assignment. It proved to be time-consuming to locate the group who eventually evaded SWVDs and completed the assignment without their contribution. This left SWVDs feeling de-valued and incapable of participating in the group assignment. Students treated in this way are in disbelief that the group could exclude them and complete the assignment without their contribution. Student respondent L pointed out that the other group members appeared to be unorganised and had the group failed the assignment, it would have been out of his/her hands to do anything about it.

Students revealed another problem with group activities. This involved difficulty in shared reading exercises. Students with visual disabilities are unable to share reading material due to modifications, and other assistive devices required to assist SWVDs will not be available at the time.

When their contribution to the assignments is unappreciated, SWVDs are left feeling isolated and misunderstood. Sighted students do not take into consideration the significant impact their attitudes have in defining life-experiences, opportunities and help-seeking behaviours of SWVDs (Parashar et al., 2008). Therefore, students recommend that group work be tackled by grouping SWVDs together.

<Files\Audio Interview with Student K> - § 2 references coded [0.82% Coverage]

Reference 1 - 0.60% Coverage

Once I was in a situation like that and they just shut me out. Maybe only one person paid attention to who I am and know what I was contributing to the group, but the rest were talking among themselves. Every time I tried to suggest something, they would shut me out.

<Files\Audio Interview with Student L> - § 3 references coded [3.40% Coverage]

Reference 1 - 1.65% Coverage

So what happened we was given assignment and divided into groups. Okay, so I tried to contact this is people I was grouped with but I found that people were doing excuse they can't find the... so in so, so we don't know to what we're going to do. So, I spent a lot of time the assignment was given two weeks to be completed. Yes, so what I've been doing, I continue trying to find those students up to three, three days before the assignment was due. That's when I found them, and telling me that the assignment is done and that they made to my, my, my student number and also all my details. At the end the assignment is already done, I have never contributed on that particular assignment, so I felt that when we are grouped with others they didn't take me as someone who would have contributed on that assignment.

Reference 2 - 0.83% Coverage

We could have failed that assignment and it would have been out of my hands. This group were really; they were really not organized.

<Files\Audio Interview with Student D> - § 1 reference coded [1.27% Coverage]

Reference 1 - 1.27% Coverage

Because, you know, when working in a group we share notes, so sometimes you need to read something. You need to share something, which for me is more difficult in terms of the font to read in front of them. But when I do, when I am on my own, I'm able to use the laptop, the magnifier. And then that's where I get everything done and completed. And I'm able to share with them whatever I need to share with them.

<Files\Audio Interview with Student F> - § 1 reference coded [0.82% Coverage]

Reference 1 - 0.82% Coverage

Okay, in terms of a student that is completely blind, he or she will be sitting amongst his or hers peers, he or she will be collaborating with them, there will be a major gap that he or she will have to overcome when contributing to that group. And he or she might feel that their contribution is not being appreciated.

<Files\Audio Interview with Student B> - § 2 references coded [0.74% Coverage]

Reference 1 - 0.34% Coverage

In most cases if we have like group work we try to ask the lecturer to put us, the disability unit students, together in one group.

Drawing from the experiences of SWVDs, they appear to be less interested in social interaction and have a tendency toward social isolation because they do not receive any feedback or positive response (Salleh & Zainal, 2010). However, SWVDs who fail to interact with other students and do not demonstrate good social behaviour will suffer isolation and segregation from their sighted peers (Salleh & Zainal, 2010). While working in groups can increase feelings of belonging among SWVDs it also provides opportunities to work with and become familiar with other students (Bensen & Dundis, 2003). Madriaga (et al., 2011) supported Benson and Dundis (2003) in that the most effective way to alter attitudes favourably is to combine teaching and learning with direct contact with SWVDs.

5.5.3.2 Other Related Problems Faced by SVWDs when Working in Groups

a) Lack of Understanding

Students insisted that there is a lack of understanding on the part of sighted students as they experience difficulty interacting with SWVDs. Sighted students found it incomprehensible that SWVDs had to face several obstacles to perform simple, taken-for-granted tasks like leaving the classroom. It was difficult for them to collaborate with SWVDs, who valued and understood each other's strategies and contributions:

<Files\Audio Interview with Student B> - § 2 references coded [1.71% Coverage]

Reference 1 - 0.75% Coverage

Yeah, I understand that ma'am but the problem is some students don't really understand how we operate, it makes it difficult for them to collaborate with us in that way because we know each other we understand each other, we know how we work, we know our strategies. We know our, you know – yeah

Reference 2 - 0.97% Coverage

I don't know but I feel like if people understood that for example a blind student in their you wouldn't just stand up walk out, you wouldn't. You would want to see how they are gonna manoeuvre around the classroom until they get out of the class or in the class. So, I feel like, also the students don't really take the time to understand us and maybe help us wherever possible.

b) Uncomfortable

Student respondent D found it more challenging to work in a group because having a disability can influence the perception that one held about SWVDs, which may result in them being de-valued and stigmatised. Therefore, some SWVDs are concerned that disclosure could lead to negativity and lack of access (Vickerman & Blundell, 2010).

<Files\\Audio Interview with Student D> - § 1 reference coded [0.93% Coverage]

Reference 1 - 0.93% Coverage

To be honest, it becomes more challenging to when working as a group, cos definitely I would not disclose my, I would not disclose the challenges that I have. So what I would prefer or what I rather do is step out or talk from distance with them or whatever I share I'll share when I am not around them.

c) Time Taken for Feedback

Due to the use of assistive devices and other adaptations to fonts, SWVDs are unable to interact and give appropriate feedback on time. Student D conveyed that it proved to be a difficult task to provide feedback immediately as group members might expect.

<Files\\Audio Interview with Student D> - § 1 reference coded [1.63% Coverage]

Reference 1 - 1.63% Coverage

They do take my contributions, but what I'm trying to say is that I do not contribute immediately because of one, you know, sometimes you need to read sort of thing. You need to look at something and then you need to give feedback. So immediately I cannot do it, but when I am on my own, then I can see when I enlarge and the font and I can read properly, then I can share what info, but I cannot do it immediately. So that is why I need to prepare myself in advance before meeting with a group. I need to enlarge my notes. Yes.

Due to various problems regarding group work expressed in the ensuing arguments by SWVDs, Salleh and Zainal (2010) suggested interventions to be conducted in the classroom to help SWVDs improve and maximise social integration with other students (discussed in Chapter Two). Juklová and Ulrichová (2011) proposed another approach based on mutual meetings and sharing between SWVDs and sighted students. This allows students to introspect and understand their motives and prejudices. Effective interaction with sighted students will help SWVDs become independent and take responsibility for their actions and feel confident in the mainstream environment (Salleh & Zainal, 2010).

5.5.4 Impact on Studies

This key sub-theme demonstrated how the challenges impacted on the studies of SWVDs. Each is classified into further sub-themes below.

5.5.4.1 Time-Consuming

Clearly lecturers could do more to present course content in flexible ways by using multimodal teaching methods to increase SWVDs' ability to grasp the content. Izzo (2012) suggested that a combination of media can be used to relay concepts such as podcasts, YouTube videos as well as various ways to post notes. Failure to apply flexibility will result in poor concentration and a lack of engagement, and SWVDs may fall behind, wasting time while taking notes as expressed by Student respondent D who spent their own time trying to work out the content on his/her own.

SWVDs need assistance with recording of lectures that were inaudible and had an adverse impact on his/her studies. Student respondent F complained that recordings were not helpful as they were unclear due to background noises. Although the SWVD sought help, recordings were not adequate to facilitate learning. Student J was reluctant to ask the lecturer for assistance and reached out to other learners when he/she did not understand the course content. However, Student respondent J had to wait until other students were available to ask for any assistance with regard to what was written on the slides.

<Files\\Audio Interview with Student D> - § 1 reference coded [0.56% Coverage]

Reference 1 - 0.56% Coverage

I would say it's time consuming because if I didn't understand or get what the lecturer was saying, I need to now go and work it out on my own. Now I need to DO, more time consuming.

<Files\\Audio Interview with Student F> - § 1 reference coded [1.28% Coverage]

Reference 1 - 1.28% Coverage

They impacted me negatively, however, I had to work around it because you realise that there's not much that can be done immediately and even if something is done, i might be done with my degree by then. So, for example, in terms of the recording of lectures I sat with Dr X and he told me what to do in terms of recordings more audibly clear. You can play around with the equaliser and clear some of the background noise and that is exactly what I did. It was not perfect but it helped.

<Files\\Audio Interview with Student J> - § 1 reference coded [0.68% Coverage]

Reference 1 - 0.68% Coverage

When it comes to, when it comes to the lecture I ask the question maybe don't ask by speaking to the learners. When X displayed it on the screen, it's just that I don't know how to answer this question, then I have to wait to consult the student near me is busy to tell me what is written there.

As a result, SWVDs are not on par with other students in the class and spent more time waiting to be assisted. Drawing from the above dialog, Izzo (2012) claimed that delivering content required the lecturer to be mindful of the risk of losing the attention of SWVDs because enhanced engagement promoted retention, leading to increased achievement of SWVDs. It is apparent that although accommodations are to some extent provided and communication are sufficient, there remains inconsistencies in the application of accommodations, resulting in the lack of equal access and low retention of SWVDs (Gallego and Busch, 2015). It can be surmised from the utterances of SWVDs that the current level of communication and coordination does not adequately support SWVDs to ensure access.

5.5.4.2 Depression

The following comments made by SWVDs provide overwhelming evidence corroborating the notion that SWVDs are experiencing depressive symptoms due to a lack of appropriate intervention strategies to promote positive outcomes for SWVDs (Salleh & Zainal, 2010).

Student respondents conveyed that they were diagnosed with depression, stress and anxiety which they believed could have been avoided if proper accommodations were in place and lecturers were aware of their needs and responded to the diversity in learning styles in the classroom (Vickerman & Blundell, 2010).

Students confirmed that the current educational set-up at the university contributed to them feeling less capable intellectually; less able to perform better; unable to cope; feeling like they do not belong, with low self-esteem and a reluctance to continue with their studies:

<Files\\Audio Interview with Student A> - § 1 reference coded [0.56% Coverage]

Reference 1 - 0.56% Coverage

It has impacted quite badly, for me I was diagnosed with depression not too long ago, and stress and anxiety. Actually that is one of the things that led me to that so I think If me putting extra work wasn't the case, I think it would have been avoided. Depression would have been avoided.

<Files\\Audio Interview with Student G> - § 1 reference coded [0.34% Coverage]

Reference 1 - 0.34% Coverage

I think I went through very mild depression and for a, for some time I thought of dropping out, it was very hard but I managed to pull through.

<Files\\Audio Interview with Student O> - § 1 reference coded [0.50% Coverage]

Reference 1 - 0.50% Coverage

I was sad, I was depressed, because when I look at my marks I feel myself is like Im unable to cope with the relationships yes, I know that I can it's just the nature of eyes does not allow so I was depressed.

Negative societal attitudes, society's perceptions of disability in structuring self-identity incorporated by SWVDS are all invisible barriers to learning (Parashar et al., 2008). Negative university students and staff attitudes towards SWVDs fostered low self-esteem and poor self-image which influenced their psychological well-being leading to many SWVDs experiencing symptoms of depression and anxiety. There is overwhelming evidence from the voices of SWVDs that they feel devalued and face stigmatising attitudes resulting in segregation and discrimination that have significantly impacted their life experience causing them to suffer psychological conditions (Parashar et al., 2008).

5.5.4.3 Feeling of Exclusion/ Lack of Energy to go on/ Frustration

The university requires applying a proactive stance to encourage SWVDs to disclose their disabilities at the onset, at the same time ensuring that when they do disclose, they are treated with respect empathy and positivity (Vickerman & Blundell, 2010). Furthermore, respondents found that they had to repeatedly confront lecturers to disclose their disability to receive accommodation, which discouraged disclosure, causing them to isolate from the lesson. The stigma it brings to disclose one's disability prevents SWVDs from availing themselves to the accommodations essential to help them to be successful in the classroom and to be on par with the sighted students. However, some students expressed frustration because they had to remind lecturers daily that there are students in the classroom who have disabilities.

Students agreed that they had to make a concerted effort to get up early in the morning and use a telescope to try to concentrate, which left them out of energy at times. Disclosing their

disability and having to repeatedly disclose their disability and remain without the necessary accommodations frustrated students, thereby deterring them from attending lectures as they continue to face similar challenges.

<Files\Audio Interview with Student D> - § 1 reference coded [0.89% Coverage]

Reference 1 - 0.89% Coverage

Um, it is, as I said, emotionally, it's not nice to disclose like each and every time you go to a lecturer, to tell about your problems or what happens, you don't tell them. So we don't participate in the literature or in the classroom. And you become left out or you study on your own,

<Files\Audio Interview with Student K> - § 1 reference coded [0.33% Coverage]

Reference 1 - 0.33% Coverage

It's tiring explaining yourself every single day is tiring. By now, they should know that they have disability students of any form, of any form?

<Files\Audio Interview with Student O> - § 2 references coded [0.71% Coverage]

Reference 2 - 0.31% Coverage

Trying to wake up early, I'm using energy trying to see with the telescope, so the level of concentration is not quality.....

<Files\Audio Interview with Student P> - § 1 reference coded [0.43% Coverage]

Reference 1 - 0.43% Coverage

It's affected it negatively, because sometimes I didn't see the reason for going to class because I knew that I will have challenges with following in the lesson.

It is apparent from the above discussion that SWVDs are making the necessary disclosures at the onset of their university life, while some repeatedly disclose to lecturers. However, inclusivity has not materialised in the classroom. Many SWVDs still find themselves without the necessary accommodations to facilitate access. On the one hand, the university encourages SWVDs to disclose their disabilities. However, on the other hand, the university needs to put in the added effort to provide flexible curricula to address all areas of access on a continual base.

Lecturers need to be aware that people with disabilities are part of society and it is appropriate to support and assist them when they are approached for assistance (Juklová & Ulrichová, 2011). Furthermore, intervention programs of various types, especially those based on repeated personal contact with SWVDs, sighted students and teachers help in the development of the self-esteem of all concerned. Juklová and Ulrichová (2011) contend that what this intervention also needs is follow-up evaluations in order to compare attitudes before and after intervention to improve the entire intervention program so that it improves retention

and increased achievement.

5.5.4.4 Performance

Student respondent F felt stressed when his/her grades dropped due to having to continuously put up with the inadequate assistive devices and inconsistent methods of instruction that the university provides. Student respondent O reflected a similar frustration and disappointment in his/her performance.

<Files\Audio Interview with Student F> - § 1 reference coded [0.52% Coverage]

Reference 1 - 0.52% Coverage

I would say that it caused me, it caused unnecessary stress, I would say, a drop in my grade, those two things would be attributed to the issue of the noise in the background while recording the lectures.

<Files\Audio Interview with Student O> - § 1 reference coded [0.56% Coverage]

Reference 1 - 0.56% Coverage

Like badly because you know sometimes we writing tests writing, practical's, sometimes getting very low marks, which I knew that these marks are not like me, I'm not able to cope in the way things are going. So, my marks were too low.

There is an increase in the diversity of students that the university is challenged with. Such challenges need to be addressed to make higher education more accessible to SWVDs. As such, this study promoted the UDI strategies for enhancing academic standards to improve engagement and achievement (Izzo, 2012).

5.5.4.5 Failure

Students attend university unaware of their right to reasonable accommodations and adjustments to the curriculum to equalise education for all. The current level of communication is insufficient, leaving SWVDs to flounder about the university in search of ways to succeed in a difficult environment. Student respondent F lost an entire semester and failed a module for the first time due to the current level of communication and coordination that does not adequately address access (Gallego & Busch, 2015).

Based on the storied realities of the respondents, it is reasonable to declare that there are critical access issues that need to be tackled in order to provide effective learning experiences for SWVDs. Since lecturers are unprepared to implement accommodations and express concerns about taking that decision, students conferred that they had to put in their own

efforts by interacting and obtaining assistance from other students. Some respondents claimed that being persistent in trying to acquire accommodations could result in one becoming a nuisance. Students believed that lecturers could fail them seeing that they do not fully understand their responsibility to provide accommodation.

<Files\Audio Interview with Student F> - § 1 reference coded [2.21% Coverage]

Reference 1 - 2.21% Coverage

When you health, when you have some type of disability and I went through my first semester of university and I didn't contact them because I thought that you know what I went through twelve/thirteen years of schooling and I was treated as a normal child, and I thought there was nothing that can be done about my visual impairment. I actually wanted to go through the whole of university without being assisted because I thought nothing could be done. I went through my first semester and entered my second semester and I managed to fail my first test in my entire life. And I remember why I failed that test, because I knew the content but when I went into the venue, the lighting was just terrible and I asked the invigilator to turn off the lighting and he couldn't do it, and it actually went worse and I failed my test. I went to the disability unit to get help.

<Files\Audio Interview with Student L> - § 1 reference coded [0.93% Coverage]

Reference 1 - 0.93% Coverage

Well, I DO I think, I think the reason that made her treat me this way, I think she thought that I, I expected a special treatment and because I'm blind, and she told me so that just because I'm blind, it won't be fair to other students. And I said, well, is it fair to me that I have to do this, knowing that I've already failed in this assignment, cos once you reduce marks, without even starting counting my mistakes, it was clear that I already failed.

<Files\Audio Interview with Student L> - § 1 reference coded [0.65% Coverage]

Reference 1 - 0.65% Coverage

Yeah, that's all I can say that my experience at the university has thought that students with disabilities do not have to just sit and wait to be accommodated. sometimes I need to do things myself, try to be interactive with other students. when you are interacting with other students think that they do, they do listen.

<Files\Audio Interview with Student J> - § 1 reference coded [0.87% Coverage]

Reference 1 - 0.87% Coverage

Yes, that's why it was difficult in my life. I go to my room without knowledge knowing just to know only that module name. What the lecturer was saying to the students, it was difficult for me, if you continue contacting lecturers maybe you fail because there was no improvement that was happening. I tried to consult about my concerns but there was no follow up in the classroom.

It can be deduced from the voices of SWVDs that Teachers' attitudes have not changed considerably. This study consulted several studies to understand how the negative attitudes of lecturers have attributed to a lack of reasonable accommodations for SWVDs (Gallego & Busch, 2015; Vickerman & Blundell, 2010 and Campbell et al., 2003). This calls into question awareness-raising amongst lecturers to increase their understanding thus striving for

an inclusive classroom which concurs with the premise of social justice education and the need for advocacy (Gallego and Busch (2015). Kasiram and Subrayen (2013:pg. 70) asserted that SWVDs feel “imprisoned” because of being denied opportunities and access to what is available to dominant groups. It is for this reason that the researcher has embarked on drawing attention to strategies employed by UDI where the quality of HE can be improved through the creation of a more flexible and student-centred approach providing a learning environment that motivates for the independence of all learners (Izzo, 2012).

5.5.4.6 Withdrawing from Modules / Avoiding Class/Medical and Hospitalisation

The registration of the majority of SWVDs is concentrated mainly at the college of Humanities. There has been debate as to the reasons that students are restricted to only a few faculties/colleges at the university. Student respondent L confirms this notion by exclaiming that they ended up studying a module that lacked interest and therefore ended up withdrawing from this particular module due to a lack of inclusive pedagogies that did not accommodate for map work and graphically related work:

<Files\Audio Interview with Student L> - § 2 references coded [1.59% Coverage]

Reference 1 - 0.95% Coverage

Well to my study as a whole I find that as I said that you'd find that other choices are just not enough for us, so you will find yourself studying a module that you really were not interested in but because of you see it's the one module that you can DO to the best of your ability. Cos, the module, there were modules I really withdrew from because of that, I, I, I, I saw that I, I couldn't cope with the, with the content that was being made available for me there.

Reference 2 - 0.64% Coverage

Cos when they asking questions graphically related maybe related to maps and all of that, you will that, yeah you will find that – you will find one thing as a visual impaired student, you really can't see what's on the map.' And when they asking questions in relations to that ...yeah, it really becomes a problem.

The lack of willingness to provide accommodations and misconceptions about SWVDs compounded with the negative attitudes of staff and other students towards SWVDs contribute to the negative experiences of SWVDs. As a result, SWVDs felt no longer motivated to attend classes, which resulted in a decline in their academic performance:

<Files\Audio Interview with Student M> - § 1 reference coded [0.88% Coverage]

Reference 1 - 0.88% Coverage

Yes, during my second semester, it affected me because I was bunking, bunking classes. I was just that

oh today I won't come to classes because of other students. Oh, I won't go to class for today. Yeah, so not attending classes. So I won't hear what the teacher is teaching. So I can't see everything all the time. Yes. So yeah, I dropped compared to my first, my previous semester.

A further impact on the academic progress of SWVDs causing early dropout and poor retention lies heavy on the stress of education, health, problems with medications, and hospitalisation. Student respondent A showed extreme concern regarding how this would impact their academic work:

<Files\\Audio Interview with Student A> - § 2 references coded [1.05% Coverage]

Reference 1 - 0.44% Coverage

My medical history is that I lost my eyesight when I was 21. I was diagnosed with hydrocephalus which is a brain disease and also chronic, when I'm all stressed out, faced with doubt and work is getting to me I relapse basically.

Reference 2 - 0.61% Coverage

And, I have to go back to hospital for operation and stuff and also that it actually impact my academics, because its time away from school, maybe a week or two and when I do come back I have a ton of work waiting for me. It hurts because I have to go on pills, anti-depression medication for two months. It's a lot.

Although reasonable accommodations and communication are somewhat sufficient, the experiences of SWVDs reveal inconsistencies in the perception of staff towards inclusivity and anti-discriminatory practices. Students inferred that staff tended to dissuade SWVDs from attempting degree courses they felt would not be viable for SWVDs to attempt. As such, lack of willingness to accommodate and misconceptions lead to many lecturers still being concerned about risking the academic integrity of the module, lowering its standards, unfair treatment and a lack in the confidence to work with challenges associated with SWVDs in the classroom, such as their behaviour, attendance and ability to handle the workload (Gallego & Busch 2015; Storrie et al., 2010 and Campbell et al., 2003).

5.5.5 Current coping mechanisms in the classroom

Current coping mechanisms are classified below. However, challenges outweigh coping mechanisms, thereby further warranting the need for UDI in the classroom.

5.5.5.1 Recording

Student respondents B and M complain that they could not see the slides and required assistive devices to be brought into the classroom to facilitate participation. Student respondents expressed that they are oblivious to what is on the projector slides. All they can do is rely on auditory processing skills without understanding because in order to understand, SWVDs required seeing and following what is on the slide. The students divulged that it was difficult to listen to the notes on the recorder and tie it up with the written notes from the lecture presented in the classroom. However, SWVDs are highly dependent on recorders to record information at lectures to enable them to keep up with the work.

<Files\Audio Interview with Student B> - § 1 reference coded [0.72% Coverage]

Reference 1 - 0.72% Coverage

Well, the only okay, when I'm in class, the lecturer walks in right and then they show the slides, which always we cannot see. So we highly we highly dependent on what the lecture is saying. And also using recorders to record the information that lecturer gives during the lesson.

<Files\Audio Interview with Student M> - § 1 reference coded [0.94% Coverage]

Reference 1 - 0.94% Coverage

And, and I'm not...they teaching the first row, I can't see the slides on the projector. I can't see I only listen but for me, in order to understand what she's saying I need to see and listen. It is very difficult for me, I will just write whatever she's saying or even record the teacher and after the class, I will go and look for a note and began to understand what the teachers or lecturers were saying.

It is a painstaking exercise for SWVDs to record lectures and try to catch up. Clearly this does not speak of inclusivity. To enhance student achievement requires presenting content using a variety of teaching strategies guided by UDI to accommodate different learning styles especially due to the multiplicity of visual impairments that SWVDs could be faced with.

5.5.5.2 Devices/Moodle/Photos

Although delayed in their response to the accommodations the university provided, Student respondent J felt lucky to have received assistive devices in good time. Student respondent J had experienced other problems with access and explained that it was difficult to access the online system at first and they felt disadvantaged during a lecture:

<Files\Audio Interview with Student J> - § 1 reference coded [0.63% Coverage]

Reference 1 - 0.63% Coverage

Luckily, I have received all my devices earlier, so I Don't have any problem according to the material that they gave me. Just in two to three months this year I have never received those devices, but after that I receive all my devices and now I'm comfortable about them.

<Files\Audio Interview with Student J> - § 1 reference coded [0.71% Coverage]

Reference 1 - 0.71% Coverage

But when I was attending on the venues it was not easy because I don't even take notes, if i can see in front of me, i go home without any knowledge. or even if i don't hear properly the lecture, I go to my room without any information. Then I have to check it myself on Moodle what was being studied that day.

Student respondent G improvised and took photos to compensate for not having the content available to her in the classroom.

<Files\Audio Interview with Student G> - § 1 reference coded [0.30% Coverage]

Reference 1 - 0.30% Coverage

What I normally do is I take photos and later read them over and take notes of what is important. That's what I normally do.

By its very nature lecturers, who only deliver content primarily through lectures risk losing SWVDs who may fall behind, lose interest and eventually drop out. Therefore, the application of a UDI model can change the playing field for SWVDs, providing numerous opportunities to interact and engage with the content, maximizing learning outcomes, enhancing retention and increasing throughput (Izzo, 2012).

5.6 Theme Two-Improvement and Recommendations

This key sub-theme examined the recommendations for improvement of the classroom experience for SWVDs. It brought a diverse set of themes.

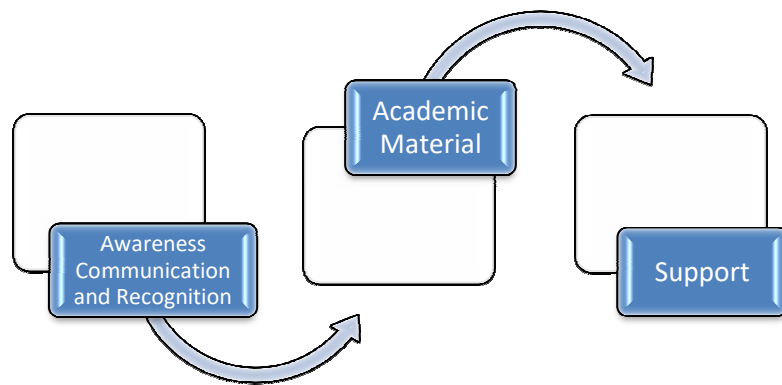


Figure 5. 14: Breakdown of Theme 2

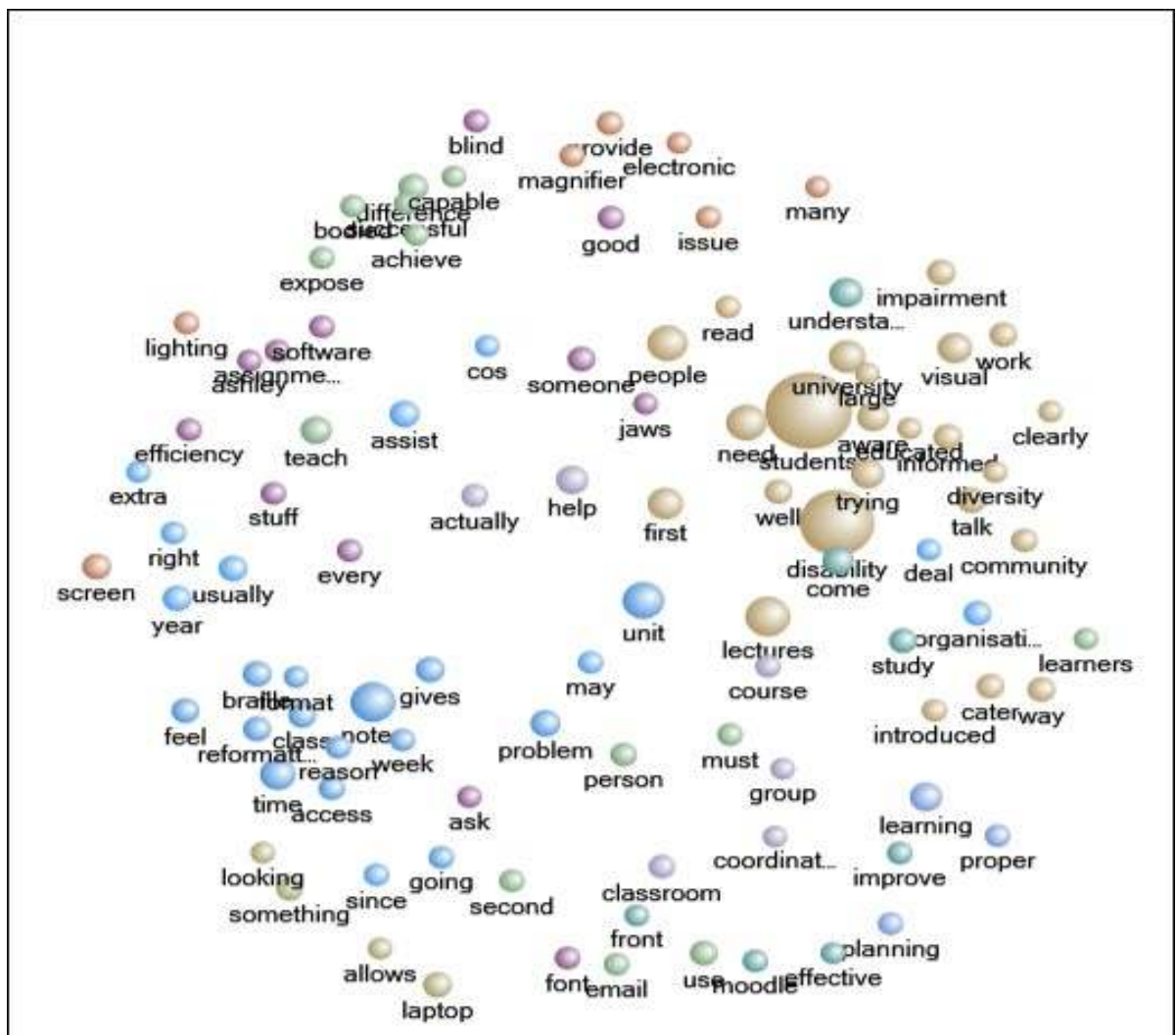


Figure 5. 15: Cluster Analysis Depicting Improvement and Recommendations

5.6.1 Awareness, Communication and Recognition

This was the most highly ranked factor. This was logical as such was needed in the classroom and could inform the UDI design.

5.6.1.1 Awareness and Understanding

Student respondents have suggested a need for more awareness programmes so that other students can know about SWVDs and understand how they operate. This was supported by other student respondents who agreed that there is a dire need for students as well as lecturers to understand their challenges, and suggested that more awareness initiatives were needed:

<Files\Audio Interview with Student B> - § 1 reference coded [0.49% Coverage]

Reference 1 - 0.49% Coverage

Awareness. I think we should, yeah I think we should just arrange more awareness programmes so that students can know about us and understand how we operate, and yeah I think that's the best.

<Files\Audio Interview with Student C> - § 1 reference coded [0.40% Coverage]

Reference 1 - 0.40% Coverage

I think university should should make the lecturers aware that they should, they should send notes that jaws is able read.

<Files\Audio Interview with Student D> - § 2 references coded [0.71% Coverage]

Reference 1 - 0.50% Coverage

Uh, also lecturers need to be, to be informed about what we go through, they need to understand our challenges and our needs as students with visual disabilities.

In the subsequent discussion, student respondents complained that it was frustrating that crucial decision-making and protocols concerning SWVDs fell on the shoulders of people who did not understand their difficulties. Furthermore, it was suggested by students that the university needed to reflect on who they recruited and the extent of their experience and exposure in handling the affairs of SWVDs. In addition, students recommended educating staff to foster understanding and acceptance of the range of visual impairments requiring special skills to promote an inclusive classroom. Student respondent K argued that staff was ignorant and that education and exposure would keep them informed:

<Files\Audio Interview with Student E> - § 1 reference coded [1.35% Coverage]

Reference 1 - 1.35% Coverage

As an activist I tried very hard to deal with such things and also you can see that some of these decisions or protocols are taken by people who don't fully understand or do not have the experiential knowledge of the difficulties of these, of course, we can never force organisations to employ people who already know where disability but I really think that and I hope this could be a development from your study.

<Files\Audio Interview with Student G> - § 2 references coded [1.55% Coverage]

Reference 1 - 0.63% Coverage

I think maybe they should be educated about visual impairment and how it works because there are lots of visual impairment. Some can see from a distance and some can't and there are lots of them so they must find a way to cater for all so that none of us are excluded.

<Files\Audio Interview with Student K> - § 1 reference coded [0.17% Coverage]

Reference 1 - 0.17% Coverage

Firstly, people are ignorant anyway. But people should be informed, you know...

Tomozii and Topală (2014) concurred with student respondents that SWVDs are unsatisfied with the current educational setup as it lacked lecturers capable of delivering an all-inclusive curriculum. Students emphasised the need for educating lecturers about diversity to promote understanding. They believed this would reduce stereotypical views and provide a quality system that aligned with the principles of UDI.

It was evident from the foregoing students' responses that lecturers are not aware that SWVDs are disclosing their disabilities on the relevant online system, such as Student Central. It was found that students who disclosed their disability status did not receive acknowledgement of their disclosure and were not afforded the necessary accommodations. Therefore, students recommended that a day such as "Orientation Day" be set aside to inform staff and mainstream students about the diversity of students at the university, and to acquaint SWVDs with everything concerning the availability of disability support systems in place at the university.

<Files\Audio Interview with Student L> - § 2 references coded [1.19% Coverage]

Reference 1 - 0.78% Coverage

My suggestion would be for someone taking a position to be a lecturer of a certain module they should be educated about diversity of students in the university, because to them, I think expecting to

see non-disabled students only when they see disabled students, the first thing they will say, say you should talk to the disability unit talk to the disability unit.

<Files\Audio Interview with Student P> - § 2 references coded [1.73% Coverage]

Reference 1 - 1.03% Coverage

I would say that maybe students should try to find out on, on their own, which is not a good thing, because a university is such a large community. So they should try maybe on an orientation day. Let students with disability know about everything, because, on my, on my profile on Student Central it is written there that I am a student with disability but I wasn't informed about anything.

Reference 2 - 0.70% Coverage

Maybe they should, they should read a student's profile first, then try to liaise with, with, with students with disability, because when they fill in the form, they do write that they have disabilities, so they should do a follow up for students with disabilities.

There is general agreement that favourable changes in attitude towards the inclusion of SWVDs and becoming more at ease with diversity in the classroom can be significantly influenced by interaction and an increase in knowledge and understanding of other students (Juklová & Ulrichová, 2011; Campbell et al., 2003 and Asprey & Nash, 2006).

5.6.1.2 Lecturers need to Understand Difficulties

Lecturers' attitudes toward SWVDs and actual classroom practice have important implications for inclusivity, as shown in the following responses:

<Files\Audio Interview with Student A> - § 1 reference coded [0.26% Coverage]

Reference 1 - 0.26% Coverage

lecturers that I've come across I think maybe would need to be more you know inclusive and try to learn about blindness and our difficulties

<Files\Audio Interview with Student B> - § 1 reference coded [0.73% Coverage]

Reference 1 - 0.73% Coverage

Well, there should, the lecturers aren't the same, you know, we, we know, we don't get the same treatment from all the lectures. No, there are lecturers who take the time to get to understand how, how we, how are we coping how we doing? And they even help us with assignments and everything,

Lecturer attitudes were proven in Campbell et al. (2003) to influence the educational outcomes of SWVDs.

Positive lecturer attitudes:

- Led to lecturers having more confidence in supporting SWVDs, and
- Helped lecturers adapt classroom materials and procedures to accommodate SWVDs.

However, lecturers have expressed a greater need for training and increased support and resources when supporting students with varying degrees of visual impairment.

Negative lecturer attitudes:

- Result in a cycle of impaired performance and lowered expectation for both lecturers and SWVDs (Campbell et al., 2003). This was reflected in Student respondent G's acknowledgement that lecturers did not have the patience to deal with SWVDs:

<Files\Audio Interview with Student G> - § 1 reference coded [0.10% Coverage]

Reference 1 - 0.10% Coverage

Because they were not patient with me

In line with Campbell et al. (2003), it was discovered that over time, lecturers demonstrated less stereotypical views, were more accurate in meeting the needs of SWVDs thereby demonstrating greater understanding about the potential for inclusion of SWVDs leading to more accepting attitudes. For instance, Student M recommended that understanding inclusion meant creating solutions with respect to seating arrangements for SWVDs where the first row is accordingly reserved:

<Files\Audio Interview with Student M> - § 1 reference coded [0.52% Coverage]

Reference 1 - 0.52% Coverage

If the lecturer can make a way. To inform the other students the first row can only seat the students who are suffering from vision only. I think it can solve... because even when I come late I can have a seat at that moment.

It was therefore recommended by students that a lecturer's level of contact is significant in promoting a positive response toward SWVDs in the classroom. However, Campbell et al.(2003) explained that although lecturers' influenced educational outcomes for SWVDs, training to develop positive attitudes towards disability should start earlier in their career.

5.6.1.3 Communication

Appropriate communication was needed in the following ways:

a) Voices

Students want their views to be heard and to learn how the DSU and the university impact their studies and assist in the achievement of their educational objectives. Students with visual disabilities want their concerns, situations and problems regarding the academic courses they are studying to be addressed at meetings at least once a week or once a month. It was also relayed in the following discussion that it was acceptable for SWVDs to receive assistance from other students in the classroom.

<Files\Audio Interview with Student B> - § 1 reference coded [0.62% Coverage]

Reference 1 - 0.62% Coverage

Well, I think, I think that should be communicated with all the students just to get just to get to hear the views, and also his disability unit coordinator to see how can we actually help each other through the process of obtaining our degrees?

<Files\Audio Interview with Student J> - § 1 reference coded [1.04% Coverage]

Reference 1 - 1.04% Coverage

Maybe if we can have that much in our group as we having group with all those people with disability problems. Maybe if they can add that as a course though it's not only academic courses that we are doing but in our group if maybe just once a week or once in a month in the Zoom meeting we speak about those situations that we have and know to who our concerns are with, when we are having problems. The other students in classroom that could help us.

<Files\Audio Interview with Student N> - § 1 reference coded [0.55% Coverage]

Reference 1 - 0.55% Coverage

And there should be organisations for students with disabilities so that they could discuss their issues and try to come up with solutions on their own which may assist them which may improve them.

Hence, SWVDs should be allowed to come together and discuss their issues and come up with solutions on their own with regard to the problems they encounter, thereby encouraging empowerment through self-advocacy:

b) Across Departments

Students with visual disabilities want to be included in all University communication and notifications. Students insisted that concerns be addressed at registration. The onus should not be on the SWVDs to consult with coordinators or communicate with someone who is in the DSU. Rather, it should be accomplished at the start of their enrolment at university. Student respondents indicated in their responses that they are not always able to access email communication and suggested that information be communicated from the onset via coordinators and lecturers every semester. In that way, SWVDs will not be hassled to repeatedly inform their lecturers about their disability:

<Files\Audio Interview with Student B> - § 1 reference coded [0.20% Coverage]

Reference 1 - 0.20% Coverage

Every communiqué there should be something specifically that reaches to us.

<Files\Audio Interview with Student J> - § 1 reference coded [1.39% Coverage]

Reference 1 - 1.39% Coverage

Maybe if they can or maybe if you start to register and you mention your situation, maybe if during the registration time they take all your notes, like your concerns, which type of disability you have, and then put it onto coding not that it is your work or your duty to consult the coordinators or communicate with someone who is in the office of disability unit. Because some others they do not find emails, so if they were able to save it from the start when you registered and then tell you which then they tell the coordinators consult your lecturers each and every semester, that will be okay from you.

<Files\Audio Interview with Student M> - § 1 reference coded [0.53% Coverage]

Reference 1 - 0.53% Coverage

they should be informed right on the onset; before they even get the students they should be aware. So the university should make them aware beforehand that they're going to be, you know, students with disabilities in the classroom.

Non-disclosure of one's disability has been associated with stigmatisation as SWVDs are concerned about different treatment (Majoko, 2018). Students do not want to be perceived negatively or as a problem to their lecturers and others in the classroom. Therefore, SWVDs recommend that the university have a once-off disclosure on enrolment that involves consulting coordinators and communicating with the relevant stakeholders and the DSU with regular follow-up meetings to address concerns.

5.6.1.4 Able-bodied Students

Able-bodied students also needed to understand the concept of disability and SWVDs.

a) Understanding People with Disabilities/Sharing environment

Able-bodied students, lecturers and SWVDs require intervention strategies that focus on personal contact, interaction and shared experiences to understand similarities and differences so they can learn how to interact with one another in a classroom situation.

Student respondent A and M contended that SWVDs want to be visible because they may be different but they come to university with the same intention as other students:

<Files\Audio Interview with Student A> - § 1 reference coded [0.75% Coverage]

Reference 1 - 0.75% Coverage

If if more and more students understand that, we are here we are also here for one thing as much as as much as they are able come to vacity and study, us too, we can do the same thing we are here for the same thing. And we're here basically to be visible and make sure that we, they understand that although we are different in many ways. Our our strengths and and sometimes it feels like no

<Files\Audio Interview with Student M> - § 1 reference coded [0.29% Coverage]

Reference 1 - 0.29% Coverage

They can improve that by make awareness to other students that there are students who suffer for any other reason like mine.

Several studies supported the finding that conflicting feelings due to contact with SWVDs was mainly owing to ignorance, inexperience and the inability to interact effectively with these individuals (Juklová & Ulrichová, 2011; Salleh & Zainal 2010 and Parashar et al., 2008). It was found in Juklová and Ulrichová, (2011) and Louari (2013) that personal contact with SWVDs enabled able-bodied students to understand their challenges. Thus, it promoted the use of intervention strategies that are based on personal contact with SWVDs. It was recommended in Louari (2013) that such awareness initiatives be implemented at every institution of Higher Education throughout the entire course of study to cultivate feelings of acceptance, change perceptions and create an understand that disability is not the real reason for exclusion, but it is society that perpetuates biases and negative attitudes towards them (Social Model).

b) Sharing Environment

Sharing of experiences leads to a deeper understanding and acceptance of SWVDs, thereby influencing the development of self-esteem for everyone involved. This in turn motivates for a more intense introspection of the students, thus providing a clearer understanding of their motives and prejudices (Juklová & Ulrichová, 2011).

Student respondent A indicated that exposure may provide the necessary shared experience to help develop an understanding about the biases and misconceptions held by other students in relation to SWVDs:

<Files\\Audio Interview with Student A> - § 1 reference coded [0.60% Coverage]

Reference 1 - 0.60% Coverage

I think, being, having the vacity to expose or exposure, or teach other students who are able bodied that they're sharing the environment with students with disabilities. Just because we, just because I'm a blind student, this doesn't take away from me a, it doesn't take away from me the fact that I am also human.

In line with the Universal Design of Instruction, sharing experiences through interactions between able-bodied students and SWVDs can be used as a strategy to address inequities by enhancing the quality of HE and providing a flexible, student-centred educational environment (Izzo, 2012). Juklová and Ulrichová (2011) agreed that sharing experiences strengthened the interaction between all students at the university by sharing existing physical, mental, social and cultural differences amongst students, thus cultivating an academic environment bent on enhancing the development of the personalities of all involved.

c) Less Judgemental/ University role in Educating about PWDs

Student respondent A explained that awareness and understanding is paramount for combating the entrenched negative attitudes held by other students. There are negligible differences between other students and SWVDs, who are also capable of being successful and achieving academically. Student respondent A's discussion revealed a gap in students' knowledge, which may lead to misconceptions that Louari (2013) explained could only hamper the inclusion of SWVDs and perpetuate prejudices and negative attitudes towards disability:

<Files\Audio Interview with Student A> - § 1 reference coded [0.95% Coverage]

Reference 1 - 0.95% Coverage

In Zulu, ‘‘abantuabanobumpumputhenabobayakwazi’’ people with blindness too are capable to be students and be successful. I think other students will be able to see less differences between them and us if they understand that us too we are capable of being successful and also achieve good good marks and stuff like that, because I think if another able bodied student think that because I’m a blind student with disability, okay, if they see a different they will surely treat it differently.

<Files\Audio Interview with Student A> - § 1 reference coded [1.48% Coverage]

Reference 1 - 1.48% Coverage

Okay, so maybe the university can teach able bodied students that there's not much difference just because I need assistance I need a screen reading software for me to read my notes. That difference does not matter difference between them and us does not matter because we can achieve the same performance in our academics as they can so if the varsity can actually teach, I know it sounds like I’m trying to spoon feed people able bodied people to understand that us too we are students to learn and be successful as much as they are here to do the same. So if the university teach and expose in a positive manner expose people with as people who are who are also capable of achieving success. I think that it will somehow help I just know in what manner they can do it.

Student respondent A believes that the university needs to influence able-bodied students towards the acceptance of SWVDs, who are capable of achieving the same performance in academics and attain success. It stands to reason that when working with a diverse cohort of students, the university must prioritise developing and cultivating the personality of all students and influence their values (Juklová & Ulrichová, 2011). The university’s central focus should be to distinguish and cultivate the following three human values in students:

- creative values that students can share with the world;
- experiential values that students will gain through integration and interaction; and
- Attitudinal values that encourage attitude shifts in response to different life situations.

Stemming from the above discussion, there are various avenues that the university needs to explore in terms of sensitising able-bodied students towards SWVDs. They need to provide the necessary exposure and valuable interactions between all students to eliminate misconception, biases and prejudice as well as foster positive attitudes, acceptance and changed perceptions. Most importantly, the university needs to involve all students in the planning of all intervention strategies and initiatives, thus empowering students to self-advocate. Such intervention strategies may include sharing experiences at regular meetings

such as class excursions, sporting events in support of disability awareness and introductory workshops exploring diversity (Juklová & Ulrichová, 2011).

5.6.2 Academic Material

Academic material was also very highly ranked and stirred strong argument as the classroom experience was dependant on the understanding of academic material. Academic material is a key factor in higher education. It was informed by the following:

5.6.2.1 Planning Ahead- Alternate Formats and Accommodation

More planning was needed ahead of time for alternative formats of academic material in the classroom.

a) Alternative formats /Added notes/ Prioritise needs of SWVDs

Student respondents claimed that poor performance can be statistically proven to be due to a lack of reasonable accommodation. For instance, notes were not reformatted and delivered to them. In addition, the onset of the COVID-19 pandemic revealed that the DSU was not prepared to adapt its services to SWVDs. Instead, it intensified the challenges faced by SWVDs as DSU staff were not available to assist SWVDs with the usual services such as reformatting and the dissemination of adapted course materials.

<Files\Audio Interview with Student E> - § 3 references coded [1.45% Coverage]

Reference 1 - 0.38% Coverage

But you can do a quantitative analysis? of SWVD's post COVID you would see that the performance was not even there,

Reference 2 - 0.45% Coverage

Because there was no reasonable provision of access of materials so there were no notes being reformatted and delivered to them you know.

Reference 3 - 0.62% Coverage

To us, even access to the exam room, did not happen you know, because COVID made it nearly impossible for the disability unit staff to come in print and disseminate the stuff to SWVD's.

Student respondent L complained that notes are in incompatible formats, requiring SWVDs to go to the DSU for reformatting purposes. Students with visual disabilities did not like having to repeatedly go to the DSU or to rely on others for assistance with accommodations. It was also time-consuming and frustrated SWVDs who could not engage with their notes upon going back to their residences like other students were able to do. In addition, Student respondent Q advised that lecturers did not provide worksheets in adapted formats like Braille or enlarged fonts for SWVDs. Since Braille took time, the students recommended that worksheets be printed in Braille well in advance to enable SWVDs to also engage with the materials during the lesson. Student respondent P concurred with Student Q that lecture notes should be provided in advance and in the appropriate formatting to meet the individual needs of SWVDs:

<Files\Audio Interview with >Student L- § 1 reference coded [1.62% Coverage]

Reference 1 - 1.62% Coverage

Yeah, I don't want to be sent to the DSU all the time. I need to do something, I need to go to the class and feel like I'm a part of the class and go back to know the feeling when you find that, okay, the class will be will end at half past 12. And then I have to go to my room. But my problem is, because I'm a student with disabilities, I would have to go to the disability unit, with some notes to be reformatted and all of that. I don't know why always the notes is in a format in one format, maybe there's a reason for this, but I don't know why. Because it always gives us problem when you find that people are going to their, their residences, and until I have to go to unit so my notes will be formatted first so I can start engaging my material and that takes time, the reformatting takes time.

<Files\Audio Interview with Student Q> - § 2 references coded [1.26% Coverage]

Reference 1 - 0.43% Coverage

Okay, sometimes some lecturer, some lecturers when they enter the class they usually maybe give us some worksheets. Some old like mine to be out, I would really like mine to be in braille.

Reference 2 - 0.82% Coverage

Yes, um, they should um the thing is that braille takes time, braille notes take time to be done so I think maybe before maybe take maybe maybe about two weeks or maybe they should go to the disability unit. Maybe two weeks before they will be teaching and then ask them to make braille notes for us, so that when they teach us the braille becomes available.

<Files\Audio Interview with Student P> - § 1 reference coded [0.59% Coverage]

Reference 1 - 0.59% Coverage

Maybe they should provide, also when, when the lecturer is using light, maybe they should provide us with papers, maybe with notes, hand copy notes so if we can't see clearly on the data projector, we can refer on the notes.

Although the university has put forth some effort in terms of the provision of accommodations many barriers still need to be addressed to enhance communication between staff, SWVDs and the DSU to improve students' experience. The degree of understanding about accommodations and differences in perceptions leading to the inconsistent application of accommodations results in poor performance and low retention of SWVDs (Gallego & Busch, 2015).

Drawing from the above discussion, it is apparent that SWVDs are content to provide their own input in terms of how to adapt and improve the system to suit their needs. A study by Vickerman and Blundell (2010) revealed that interviewing SWVDs as part of the application process opened communication channels that provided insight into how the university was going to support them and provide SWVDs an opportunity to visit the university and discuss their needs. This had a two-fold benefit as it involved SWVDs in the decision-making process and also resulted in a positive response from staff (Vickerman & Blundell, 2010).

b) Lessons /Course Material before Hand

The lack of consideration for the unique learning needs of SWVDs and the non-provision of lecture notes in advance hindered the participation of SWVDs and limited their progression at university (Majoko, 2018). **Student respondent E** suggested that SWVDs needed to be kept abreast of the lessons by ensuring proper planning and forecasting and ensuring that all course materials were available in advance to meet the needs of SWVDs. In addition, student respondents emphasized the importance of training on how to use relevant learning websites such as Moodle. In so doing, students maintained that it will ensure they had access to the notes in preparation for the lecture ahead of time. It would also ensure that SWVDs had sufficient time to have the notes adapted to the correct size or reformatted at the DSU. This would be helpful to SWVDs, ensuring that they are on par with other students and can also fully engage in the lesson presented on projector slides.

Student respondents agreed that lecture notes should be provided before hand. However, they confessed in their responses that this was not the case with some courses because lecturers preferred to provide notes after the lecture, claiming that providing the notes online before lectures caused students to not attend.

<Files\Audio Interview with Student E> - § 1 reference coded [0.54% Coverage]

Reference 1 - 0.54% Coverage

I think proper planning and lesson planning you know forecasting and so on and I think and the full effective use of Moodle, and learn whatever, the learning website.....maybe give us the slides beforehand. So we have an idea of what's happening.

<Files\Audio Interview with Student E> - § 1 reference coded [2.52% Coverage]

Reference 1 - 2.52% Coverage

The maximum use of it could ensure that people will have access to, for instance if I could get the notes on the Moodle website ahead of time then of course you know that second week second of August you going to teach one, two, three and you can do your presentation early, you can post it there it gives a person, a student with visual disabilities reasonable space to get it printed out and reformatted by the disability unit to ensure that they are on the same level as other students, so that could actually do will be able to do active listening in class and notes what they have to note on their presentation, on the on the slides, on thewhatever paper. So that is really helpful because I know that there are times where even looking at the IPAD is too difficult.

<Files\Audio Interview with Student A> - § 3 references coded [1.07% Coverage]

Reference 3 - 0.54% Coverage

Yes, yes. In my past modules I have but the excuse was that they can't give out the slides beforehand because some students don't attend; the students need to attend the classroom. Most of them that is the excuse, and maybe on that Friday you will have the slides for that week.

Lecturers are more concerned about how accommodating SWVDs will impact the learning of other students in the classroom. Although many staff have displayed willingness to accommodate SWVDs, studies such as Gallego and Busch's (2015) and Vickerman and Blundell (2010) have shown that a lack of enthusiasm to make major changes to the curriculum was due to a lack of training on how to respond to SWVDs in the classroom, lowering standards and risking the academic integrity of the course. Gallego and Busch (2015) argued that such attitudes and misconceptions about accommodations manifested due to the lack of appropriate training and essential knowledge regarding legal mandates, procedures and legislature about SWVDs and accommodations.

5.6.2.2 Compatible Lecture Content

Re-thinking the provision of compatible lecture content and the nature of the curriculum to ensure flexibility in instructional methods (UDI) will increase student engagement with the content, which will ultimately enhance the retention and achievement of a diverse population of learners (Izzo, 2012). In the subsequent responses, students explained that this was not the case in their experience. Although lecturers are aware of SWVDs in the classroom, they did not provide the notes in compatible software to ensure that SWVDs could access it through assistive technology like JAWS. Furthermore, students admitted that font sizes were not adjusted to accommodate SWVDs in the classroom and lecturers did not consult with SWVDs about what type of adjustments they required.

<Files\\Audio Interview with Student C> - § 1 reference coded [0.26% Coverage]

Reference 1 - 0.26% Coverage

They're aware, but they haven't made the notes compatible with the jaws software.

<Files\\Audio Interview with Student D> - § 1 reference coded [0.71% Coverage]

Reference 1 - 0.71% Coverage

Or maybe if there was a way for them to, like I've said since I have visual challenges that they could have in the classroom, cater for us too, as students with disabilities and in terms of the font size, as I've mentioned before.

<Files\\Audio Interview with Student P> - § 1 reference coded [0.55% Coverage]

Reference 1 - 0.55% Coverage

I think maybe first they should ask us, students with visual disabilities, they should ask them, which font they prefer maybe when they display on data projector so that they can feel accommodated and stuff.

Lecturers are not providing compatible lecture content to meet the diverse needs of SWVDs in the classroom. Clearly, the UDI concepts and practices have not been integrated into policy and practice because had the university employed such, Universally Designed of Instructional approaches would have catered for the SWVDs by providing alternatives with regard to the materials, content, tools, context and supports they required (Izzo, 2012).

5.6.2.3 Tutorials and Extra Classes/ Training for Practicals

Student respondents recommended that there be tutorials to educate SWVDs about the courses they have selected to assist them with the skills required to do those courses. In support of this initiative, students suggested that training through preparatory extra classes and tutorials will better equip SWVDs with the skill required to tackle certain courses that may require a practical component, such as the use of a microscope. This was expressed in the following responses:

<Files\Audio Interview with Student N> - § 1 reference coded [1.93% Coverage]

Reference 1 - 1.93% Coverage

So maybe those things like that tutorial should be for first years even up to whenever they want to study, but not only for first years but for those with disabilities should be extended to their second year or third year so that they could be able to interact because they usually learn by talking a lot. And in the classroom, maybe the lecturer he introduce the content and skills and then he expect that the people have understood since some of them were usually able to see the writing there. So for those who its usually done by hearing that, it become more difficult. So I think theshould be present there extra classes for those sinceso I think anything should be done right now.

<Files\Audio Interview with Student O> - § 1 reference coded [0.72% Coverage]

Reference 1 - 0.72% Coverage

I think before introducing that concept they must first try to train these learners with disabilities so that they can be finding ways how to improve the way of using microscope, how can they make microscope profitable for their condition so that's why the chapter is introduced, they can learn easy.

It can be surmised that with appropriate training, misconceptions and a lack of willingness to accommodate SWVDs can be prevented. However, a study by Gallego and Busch (2015) disclosed that many staff involved with servicing SWVDs considered training difficult due to time constraints as they had other responsibilities and preferred a hands-on approach to training in conjunction with the support offered by the DSU. Course content is introduced by lecturers and is expected to be understood by all in the classroom. This excluded students with diverse needs who learn via other means such as through listening, interacting and communicating. Due to the lack of training on how to respond to the needs of SWVDs, it significantly disadvantaged SWVDs (Vickerman & Blundell, 2010). Vickerman and Blundell (2010) attributed this to inappropriate learning objectives, a lack of adapted materials, as well

as a lack of interactions with SWVDs to determine what barriers to learning they were experiencing.

5.6.2.4 Online Continuation

It was suggested by student respondents that SWVDs be allowed to use laptops to continuously access the course materials online at their desks in the classroom, facilitating their engagement in the lesson, on par with other students. Student respondents believe that participating equitably in the lecture will make them feel comfortable to engage in the lesson and give them the confidence to be effective in the classroom. Students claimed that poor performance resulted from a lack of appropriate and reasonable accommodations to facilitate learning for SWVDs and not from their inability to grasp or understand the content. In addition, students conveyed that that one online system should be used to ensure continuity and familiarity with the system:

<Files\\Audio Interview with Student J> - § 2 references coded [1.36% Coverage]

Reference 1 - 0.46% Coverage

Yes, maybe if they, they should, if they can't do that process of making it to be for you when you sitting at the desk in front of you, maybe they will continue online for the students with disabilities.

Reference 2 - 0.89% Coverage

I would appreciate it, for me and this, I think will help a lot of students that will come back, that will be more appreciable. So that we will be comfortable with our studies, in coping with and we improve our effectiveness in the classroom. Because it's not just that we fail because we don't understand what is being told to us the problem is that we don't see what is in front of us.

<Files\\Audio Interview with Student K> - § 1 reference coded [0.20% Coverage]

Reference 1 - 0.20% Coverage

Can they just make it one Moodle, so we can be able to access it like every single time?

The ensuing dialogues of SWVDs revealed that in spite of the positive perception of the provision of support services, there still exists an urgent need to develop human capital, individual and institutional capacity for inclusive education (Majoko, 2018). Universal Design of Instruction (UDI) strategies address these inequities by enhancing the quality of higher education by prioritising equity and equitable participation of SWVDs in the

classroom through exploring a new balance in teaching and curriculum development (Majoko, 2018 and Tomozii & Topală, 2014).

5.6.3 Support

Various levels and types of support are required, as outlined below.

5.6.3.1 Devices

Devices were most highly ranked and this can inform UDI device integration into the Classroom.

a) Laptops

Student respondents believed that assistive technology should cater for all their needs. They recommended that laptops be equipped with appropriate assistive technology to adapt the course content to the individual needs of SWVDs. Students expressed their support for laptops to be allowed in the classroom to sustain SWVDs at times when projector slides are unclear or when lighting obscured the projector slides. Students agreed that such obstructions in the classroom broke their concentration as it was distracting when they were unable to follow on the projector slides. The following responses also revealed that assistive devices are important to encourage engagement:

<Files\Audio Interview with Student D> - § 1 reference coded [0.39% Coverage]

Reference 1 - 0.39% Coverage

I think is to have, I'm not sure technology wise, if they would have something that would cater for like, as an, in our laptops

<Files\Audio Interview with Student K> - § 2 references coded [0.32% Coverage]

Reference 1 - 0.12% Coverage

I thing if they could allow me to bring in my laptop.

<Files\Audio Interview with Student F> - § 1 reference coded [0.84% Coverage]

Reference 1 - 0.84% Coverage

If all of the florescence lightings are on and you got the projected screen on, we see glare. It's blur, and it's only students with good vision that can see that screen. So I feel that the lighting needs to be sorted out in venues, that's a major issue at UKZN. Lighting and the second thing is the projector screen.

Izzo (2012) emphasised that with technological innovations, computers and other devices are paramount in the classroom to help SWVDs learn more efficiently because course designs that apply UDI principles allow SWVDs to choose from a variety of technology applications to suit their learning needs.

b) Magnifiers/ Grants

Student respondents requested that the university provide electronic magnifiers, especially in libraries, as it is challenging to work with books. Electronic magnifiers are effective in helping SWVDs understand the content through reading, but students complained that it is costly and they are unable to budget for them:

<Files\Audio Interview with Student N> - § 1 reference coded [1.63% Coverage]

Reference 1 - 1.63% Coverage

Okay, that maybe on these libraries because sometimes it's hard for us to go to the library and pick a book because we usually can't see those books. Maybe they could provide those students with visual disability like with electronic magnifiers, which will be best because the budget that they give us is a they say we can buy electronic magnifier but the issue is you go to the shop you can't even buy one with those budget. So, I think they should provide them to the institutions so they could assist us like many other electronics which would be able to understand the content well.

<Files\Audio Interview with Student N> - § 1 reference coded [1.30% Coverage]

Reference 1 - 1.30% Coverage

So if I do get the time and the university usually allows us to have those grants at the beginning of the year which will assist finance, voice recorded but those things may assist us, but I think we should unite like have our own organisation that will assist us to deal with other problems that we may arise cos they usually assist us a lot with thosemagnifiers but right now its broken and they can't replace and they say the laptop that was given to me will be.

Students suggested that the finance granted to them at the beginning of the year for voice recorders should also cater for other needed assistive devices. Students also recommended the formulation of an organisation to work in collaboration with SWVDs to deal with various

problems experienced with the assistive devices as they are difficult to replace once defective.

c) Quality of Sound

Student respondent F recommends improving the microphones in lecture venues to facilitate the recording of lectures:

<Files\Audio Interview with Student F> - § 1 reference coded [0.64% Coverage]

Reference 1 - 0.64% Coverage

I would say that in terms of the recording, another enhancement that can be done is a better mic, the lecturer's lecture is going to be at the same tone throughout or audibly clear throughout the entire lecture room so that we can record it properly.

In line, with several studies the current study found that despite the paradigm shift from exclusivity to inclusivity in education, SWVDs lacked reasonable accommodations and continue to experience attitudinal, environmental and social barriers to participation at university (Majoko, 2018; Gallego & Busch, 2015; Vickerman & Blundell, 2010 and Campbell et al., 2003). Barriers to learning were found to include costly and problematic assistive equipment such as microphones, recorders, and magnifiers and a lack of availability of laptops in the classroom.

5.6.3.2 Disability Services Unit (DSU)

In their responses, students confirmed that when SWVDs come to university, they are not aware of the services of the DSU. Many students are deprived of the necessary services that cater for their educational needs and usually fall behind or under-perform. Student respondent L felt that although they needed to work closely with the DSU to obtain accommodations and the necessary support, they could only be assisted to a certain extent. Much more effort was required from the educators who needed proper procedures in place when conducting lectures with a diverse student population in the classroom. Therefore, it was suggested from the students' dialogues that SWVDs be informed at Orientation about the existence of the DSU together with the relevant contact information to assist them to utilise the support services availed to them:

<Files\Audio Interview with Student G> - § 1 reference code [1.02% Coverage]

Reference 1 - 1.02% Coverage

One of the, one of the things that I noticed is that when learners with disabilities come into the university, they don't know there's a service that caters for them. The disability unit so many of them don't get some of the privileges that we get because we had that information. Yes, so I think during orientation they should also give information about the disability unit. Where to find it, contact details, all those things....

<Files\Audio Interview with Student K> - § 1 reference coded [0.16% Coverage]

Reference 1 - 0.16% Coverage

Not quite so cos they need to work with a disability unit, honestly.

<Files\Audio Interview with Student L> - § 1 reference coded [0.84% Coverage]

Reference 1 - 0.84% Coverage

you should talk to the disability unit talk to the disability unit. But what I think is between me as students and the educator, the disability unit can only support me to a certain extent, but the lecturer should play a major role. So I think there should be a proper procedure for lecturers when they are conducting lectures with students with diverse needs. That's the problem, they don't understand diversity.

Drawing from the ensuing arguments of SWVDs, in order to prevent the perpetuation of inequality required the systematic implementation of a holistic approach to successfully accommodate SWVDs (Gallego & Busch, 2015). Understanding how to promote accessibility required the Disability Services Unit (DSU) and the institution, with all stakeholders, to comply with the principles of UDI. Thus, it could promote awareness; focus on training staff in the use of proper procedures to educate SWVDs; and provide opportunities for ongoing consultation with SWVDs to overcome accessibility challenges (Gallego & Busch, 2015).

5.6.3.3 Psychologists and Counsellors

Students with visual disabilities require psychologists and counsellors to be more accessible and recommended that they employ virtual communication platforms to reach SWVDs. Student respondents agreed that SWVDS required motivation as many lacked the confidence to pursue their studies within a main-stream environment. As such, students suggested that psychological support needed to be freely accessible and available to students when required:

Student A

Reference 1

I think maybe virtual communication for both psychologists and counsellors and students should be available.

<Files\Audio Interview with Student O> - § 1 reference coded [0.92% Coverage]

Reference 1 - 0.92% Coverage

I think if the learner they can try to organise a mental a mental trainer, a person who can motivate students with disabilities, because some of things which are a huge problem with when you have a disability you lack confidence easily so if they organise at least one person who try and talk to you actually someone dealing with mental issues. Then I think that can play a big role.

Psychologist and counsellors form important support systems for SWVDs and should be sensitive about the strong negative stigma associated with disabilities (Parashar et al., 2008). It is therefore important that psychologists and counsellors engage in empowering SWVDs to self-advocate for integration within a main-stream university (Parashar et al., 2008).

5.6.3.4 Assignment Checking

Over-dependence on written assignments will disadvantage some SWVDs as they lacked writing skills, requiring assistance with the editing and correcting of assignments before submission (Majoko, 2018). Written assignments interfered with the participation of SWVDs as it oftentimes presented difficulties since their capabilities were not considered and their unique learning needs not met. Students conveyed that they would benefit greatly from the services of a person appointed to review their assignments before submission. This would help to alert SWVDs to possible errors, alterations and problem areas that can be amended to improve performance. Although such a service is available at the university (The Writing Place), it is not widely accessible to SWVDs as it requires a person to be specifically designated to assisting SWVDs who required more assistance than other students:

<Files\Audio Interview with Student B> - § 2 references coded [1.07% Coverage]

Reference 1 - 0.41% Coverage

I think first of all, we need a someone who that we can submit assignments to in order for them to check and validate if the assignment is ready for submission.

Reference 2 - 0.67% Coverage

So we do have that. But I think we do need someone that that that's gonna be looking over our, our work like every time before we submit, we first submit to them, and then they tell us what to correct. And then yeah, so that the assignment is ready for submission.

An important tenet of successfully understanding SWVDs is to listen to their individual needs (Vickerman & Blundell 2010). It was therefore suggested in Majoko (2018) that flexibility in managing the assignments could involve the networking of SWVDs with other students in the classroom to support their participation in learning since it also provided psycho-social support for one other. This was supported in a study by Juklová and Ulrichová (2011), who perceived this interaction as a powerful experience as it promoted self-awareness and prompted SWVDs to also support each other in overcoming barriers to participation in learning (Majoko, 2018).

5.6.3.5 Reformatting Office

It is important that SWVDs are provided with a skilled IT assistant or technician to teach them how to use specific commands on the assistive devices and to understand computer technology. Many first-year students arrive at university without the necessary skills to work on computers and are also not familiar with the assistive technology specifically designed for SWVDs, such as JAWS. Student respondent A pointed out that he/she only knew one person at the university who assisted SWVDs in this regard and that the person was located on a different campus, implying that the university should consider investing more in people who can help in assisting SWVDs with respect to assistive technology:

<Files\\Audio Interview with Student A> - § 1 reference coded [1.82% Coverage]

Reference 1 - 1.82% Coverage

We, okay, the disability unit provide, okay, in Howard College, there's Dr Ashley who assists with, okay, he actually teaches how to operate the commands and stuff, umh because most students, especially first years are not really exposed to a computer in high school. I'll say I'm one of the fortunate ones because after I lost my sight in 2016 I went to a rehab centre, where they thought us different things, like Braille and JAWS, so when I came to UKZN, I was familiar with the software but the other students who are not. I think he is Dr Ashley, is the only as far as I know, he's the only person who help students with that and he I don't know whether it's at Pietermaritzburg campus, that they have someone who teaches students the software as Dr Ashley Does. But what I heard is that he

sometimes travels from Howard to Pietermaritzburg. So I think, my suggestion is if the varsity can hire some more people who can help in that department.

Subbiah (2020) confirmed that SWVDs entering the university had limited exposure to technology and digital platforms. Problems experienced included network coverage, the availability of the required technology and non-conducive environments (Subbiah, 2020). The lack of skilled IT assistants or technicians presents a major barrier to the technological advancement of SWVDs who are side-lined due to lack of access to specialised technologies to improve equitable access to education.

5.6.3.6 Have Staff with Visual Impairments

Student respondent A was highly motivated by staff with visual disabilities who work within the university and advised that the employment of SWVDs at the university be encouraged. This could open doors with regard to the employability of SWVDs and the university could use this opportunity to change the overall attitude towards disability within the university community, as this is indicated in the following student's response:

<Files\Audio Interview with Student A> - § 1 reference coded [0.85% Coverage]

Reference 1 - 0.85% Coverage

I think one, there is one thing comes to mind, is I think will help with the study is that having students with visual impairment or rather the varsity opens doors in their, in their work space for people with visual impairment. I think if other students see that there are people who work within the university community who are visually impaired that also will contribute to the change of attitude towards students with visual impairment.

In line with Vickerman and Blundell (2010), this study promoted the incorporation of a universal design model to address inequalities and enhance the quality of education with a focus on personal development, barrier-free curriculum, empowerment of SWVDs and student support services. The intention is to provide opportunities aimed at levelling the playing field in terms of the skills acquisition required for employability (Vickerman & Blundell, 2010).

5.7 Theme Three: UDI Compliance, Factors and Implementation

This key sub-theme examined if the university was currently UDI-compliant, as well as the factors necessary for implementation and the potential of UDI once implemented.

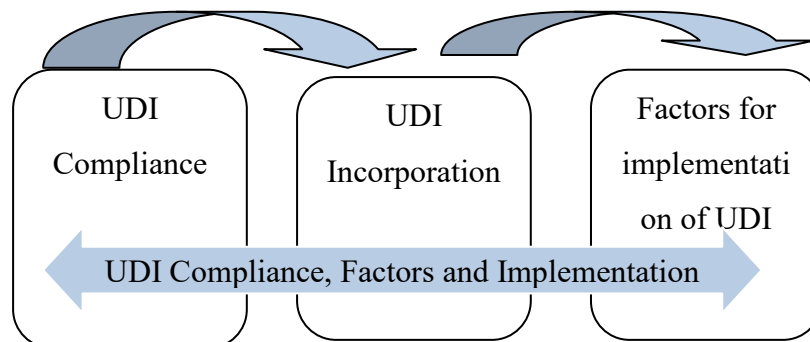


Figure 5. 16: Theme 3 Breakdown

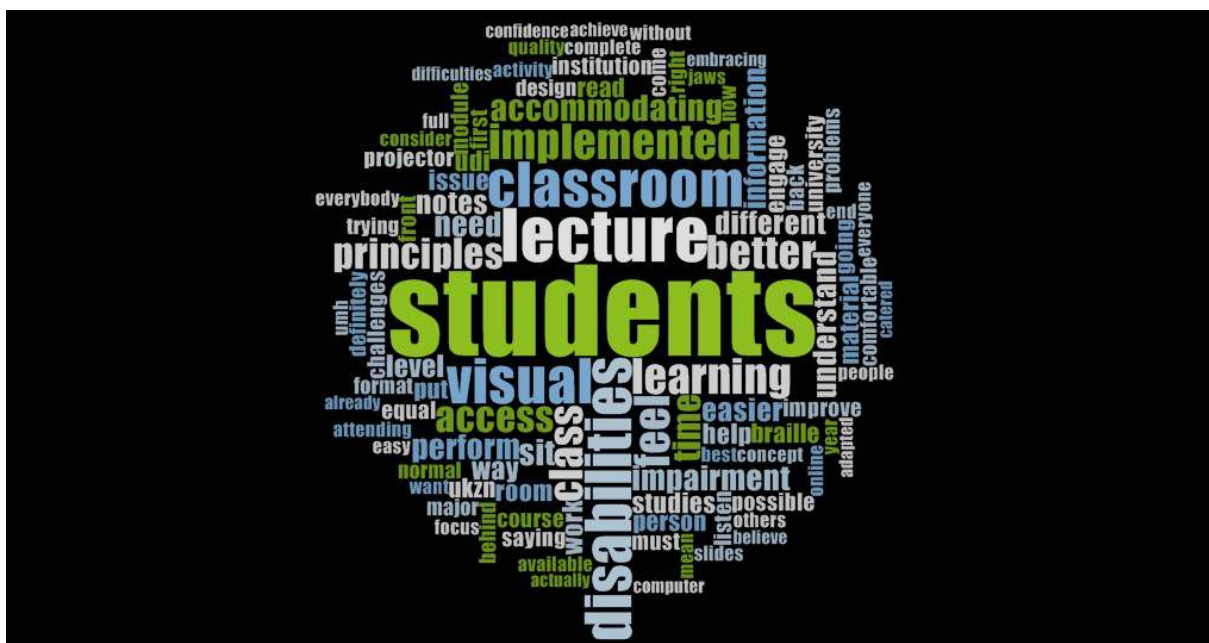


Figure 5. 17: Universal Design of Instruction- Compliance, Factors and Implementation

5.7.1 UDI Compliance

This sub-theme established whether the university was UDI-compliant for SWVD. Unfortunately, a total lack of compliance was found.

5.7.1.1 Lack of Compliance

There was a lack of compliance, as asserted by respondents.

<Files\Audio Interview with Student A> - § 2 references coded [0.03% Coverage]

Reference 1 - 0.02% Coverage

No, not all.

<Files\Audio Interview with Student B> - § 1 reference coded [0.43% Coverage]

Reference 1 - 0.43% Coverage

I wouldn't say it's not completely, but there is some, there is some effort that they putting in, to ensure that we also can access the content in the right format.

<Files\Audio Interview with Student D> - § 1 reference coded [0.25% Coverage]

Reference 1 - 0.25% Coverage

No, I don't think so. The students with visual challenges with visual challenges

<Files\Audio Interview with Student K> - § 2 references coded [0.27% Coverage]

Reference 1 - 0.11% Coverage

I don't feel it is UDI compliant, I don't see that.

Reference 2 - 0.16% Coverage

No, they are not. Currently, it seems like we don't even exist to them.

Furthermore, the lack of UDI compliance was informed by the following specific factors based on UDI Principles:

a) Lack Provisionsto Accommodate Individual Preferences and Abilities

❖ Lack of Accommodation

Several student respondents indicated dissatisfaction with provisions to accommodate their different visual disability needs. This was attributed to the fact that they continue to experience difficulties in the classroom because UDI is not implemented to fully accommodate students with different types of visual disabilities.

<Files\Audio Interview with Student D> - § 1 reference coded 0.66% Coverage]

Reference 1 - 0.66% Coverage

Uh, like you mentioned, one of the principles stated that it should be something that accommodates all students at all times, and I believe we are not, there is no, we're not, it's not implemented at the university.

<Files\\Audio Interview with Student M> - § 1 reference coded [0.29% Coverage]

Reference 1 - 0.29% Coverage

It's because the stuff that we getting is not accommodating all the students in the direction of different visual disability.

<Files\\Audio Interview with Student P> - § 1 reference coded [0.55% Coverage]

Reference 1 - 0.55% Coverage

So since I'm having difficulties, I've seen difficulty in that principle number seven principle and also the design in the classroom, yes I don't think I am accommodated, well accommodated in the classroom.

<Files\\Audio Interview with Student A> - § 1 reference coded [0.46% Coverage]

Reference 1 - 0.46% Coverage

Umh, yes, I would say yes, yes, but of course there is still room for improvement. Umh, there are some, there is a umh, there is a part where we I think the university can do better in accommodating students with visually, visually impaired

<Files\\Audio Interview with Student M> - § 1 reference coded [0.16% Coverage]

Reference 1 - 0.16% Coverage

Is because the UKZN is not accommodating all the diverse students.

Gallego and Busch (2015) attributed the lack of accommodations to limited interaction with SWVDs to understand their individual needs and make provisions accordingly. Hewett et al. (2018) agreed with students that there is still room for improvement and the university can do better by embracing a new educational perspective such as UDI, which required a period of learning and knowledge acquisition by all stakeholders.

❖ Projectors- Unable to See

Student respondents revealed that the presentation of course content was highly restrictive. Apart from experiencing difficulty viewing information on the projectors and straining to understand the content, he/she was expected to complete the class activities within the same time-frame as other students. Another student admitted that for the entire year, he/she found it difficult to cope because only data projectors were used to present course content.

<Files\Audio Interview with Student F> - § 2 references coded [3.46% Coverage]

Reference 1 - 1.64% Coverage

Students on the learning content, I believe that with contact learning we had a major issue due to them using projector which was not adapted to students, which was not adapted for students with visual impairment. So for example, if you sat in front of the lecture you would expect to have the best view but it's too much of strain on my eyes with my eye condition if I sat too far back I found myself squinting in order to try and understand what was on those slides or the projector, it created a major issue for me.

Reference 2 - 1.83% Coverage

The second challenge that I have encountered was classroom activities so, so classroom activity gets put up on the projector and I would be given only 5 to 7 minutes to do that classroom activity. However, learning must continue after that seven minutes and with me not being able to see what was on the projector screen I cannot get it done with that activity in seven minutes, that's a major issue that that I have in the lecture room and obviously learning goes on. That is not that is not equal, it's not a fair environment for students with disabilities or visual impairment to be sitting there and being treated like you know what? That a student without no visual impairment and yeah, that was another issue.

<Files\Audio Interview with Student N> - § 1 reference coded [0.99% Coverage]

Reference 1 - 0.99% Coverage

Because in the classroom you can't see what's written there but some other students are able to see that when its being discussed so it makes easier for them to understand the concept. But for us, it delays the understanding of the concept because you don't see what they are talking about. So, the institution I think partially embracing the UDI programme.

The student respondents have expressed that course content is mainly presented using projectors and that lecturers have not implemented a variety of strategies to meet the varying learning styles of SWVDs. Projectors are not adaptable and led to strain for those students whose seating positions affected their ability to see (Izzo, 2012). Due to the inability to see the presentation on projectors, which were meant to aid in the explanation of concepts discussed in the activity led to delays in SWVDs understanding the meaning of concepts and ultimately leading to a lack of engagement, non-participation and exclusion. This was supported in Vickerman and Blundell (2010), where similar findings revealed that learning was restrictive when there were inappropriate learning objectives, lack of the adapted equipment and a lack of modification of the teaching methods. All are deemed barriers to learning that significantly disadvantaged SWVDs in the classroom.

❖ Lack of Accessible Software

Although the JAWS software program and online learning systems such as Moodle are available to SWVDs, ease of access is limited. This resulted mainly from not having the relevant software installed on their laptops and not having the computer expertise to access the content from the online system:

<Files\Audio Interview with Student A> - § 1 reference coded [0.26% Coverage]

Reference 1 - 0.26% Coverage

Because there are students who are not familiar with computers and the JAWS software and to access Moodle and the slides and everything.

<Files\Audio Interview with Student F> - § 2 references coded [3.46% Coverage]

Reference 1 - 1.64% Coverage

Then when it came to online learning I had a major issue until I managed to get my JAWS software installed onto my laptop.

b) Stigma Associated with Design Issues-Bodily Differences and Mobility Challenges

❖ Size and space

A universally designed environment caters for the size and space approach where the design allows access and usability regardless of the person's body size or mobility (UDI principle 7). However, Student respondents D and P were severely disadvantaged by not availing appropriate seating space to them in the classroom to meet their specific needs, causing delays for SWVDs to adjust to the lecture.

<Files\Audio Interview with Student D>- § 1 reference coded [0.79% Coverage]

Reference 1 - 0.79% Coverage

It's going into a lecture and it's full. Cause usually I sit in the front with experiences that I've had is going into a lecture room and the lecture room is already full the seats in the front. And I have to sit at the back because I cannot see from the back

<Files\Audio Interview with Student P> - § 1 reference coded [0.11% Coverage]

Reference 1 - 0.11% Coverage

According to sizes and space for approach.

<Files\Audio Interview with Student D> - § 1 reference coded [0.78% Coverage]

Reference 1 - 0.78% Coverage

Uh, I am not catered for, so when I come to the classroom to inform my lecturer, I have to inform my lecturer I have to sit in front of the class in the lecture room. It takes time for me to adjust, sometimes I cannot even see what I'm being taught.....

Several SWVDs felt disadvantaged even though Ngubane-Nokiwa (2016) stressed that accessibility is about removing barriers to participation and engagement. The learning environment should facilitate access, regardless of the students' disability because the central objective of UDI is to provide access to education for diverse learners (Ngubane-Nokiwa 2016).

c) Materials are not Adaptable to the Needs of Students with Visual Disabilities

❖ Notes Not Adaptable/ Lack of Braille

Students with visual disabilities admit that they are aware about inclusivity, but they do not see its implementation as many have difficulty reading the notes; notes are not in the appropriate formats at the time of the lesson; and notes are not compatible with assistive technologies leaving SWVDs unable to participate or interact within the classroom. This was voiced in the following conversation:

<Files\Audio Interview with Student G> - § 1 reference coded [0.72% Coverage]

Reference 1 - 0.72% Coverage

Um, like they do teach about inclusivity and all those things but not implement it, in terms when we conducting lectures I find that, I find it hard to read the notes, so most of the time I'm just there in the classroom. I just have to listen so I can't really interact with what the lecturer is saying.

<Files\Audio Interview with Student L> - § 1 reference coded [0.53% Coverage]

Reference 1 - 0.53% Coverage

Because you'll find that maybe they don't understand what our needs as students with visual impairment. Sometimes we need some material in reformatted, cos most of our work cannot be read, does not read PDF file or PPT so they need to be changed to Word format.

<Files\Audio Interview with Student C> - § 2 references coded [0.70% Coverage]

Reference 1 - 0.40% Coverage

I do in class when the lecturer teaches us, normally, the normal of students able to take that note, while I am not able to.

Reference 2 - 0.30% Coverage

The thing is that at school, I was using Braille but at varsity they do not have it that book.

To meet the requirements for UDI, teaching and learning have to be designed in such a way that they can be adjustable to suit the needs of all learners (Ngubane-Nokiwa, 2016). This was not the case with Student respondent C who verified that they were not able to take notes like other student because he/she used Braille to perform this task.

d) The Design does not Communicate Necessary Information Effectively to the User

Students found that lecturers are not aware of the diversity of students in the classroom and had to be informed about their specific needs. As a result, the course content is not communicated in adjusted formats so that all students can engage and be part of the lesson at the same time. Since the SWVDs did not receive the information effectively, they did not understand the concepts that were presented to them.

<Files\\Audio Interview with Student D> - § 1 reference coded [0.78% Coverage]

Reference 1 - 0.78% Coverage

Uh, I am not catered for, so when I come to the classroom to inform my lecturer, I have to inform my lecturer I have to sit in front of the class in the lecture room. It takes time for me to adjust, sometimes I cannot even see what I'm being taught.....

<Files\\Audio Interview with Student N>- § 1 reference coded [0.99% Coverage]

Reference 1 - 0.99% Coverage

Because in the classroom you can't see what's written there but some other students are able to see that when its being discussed so it makes easier for them to understand the concept. But for us, it delays the understanding of the concept because you don't see what they are talking about. So, the institution I think partially embracing the UDI programme.

Drawing from the above conversation with SWVDs, it is apparent that the university is not UDI compliant, providing curriculums that are inflexible and fails to serve the diversity of students in their classrooms. The system lacked equitable use; required in designing a curriculum that is effortless to use. This was evident from interviews of many SWVDs who do not benefit for the learning activities as they do not have their notes in appropriate formats; find it difficult to understand as they cannot see what is presented to them; and the lesson is presented in ineffective ways that led to alack of engagement and non-participation.

5.7.2 UDI Incorporation - Enhance Learning in the Classroom for SWVDs

This sub-theme reflects how UDI incorporation can enhance learning in the classroom for SWVDs, as asserted by respondents in the following dialogue:

<Files\Audio Interview with Student A> - § 1 reference coded [0.02% Coverage]
Reference 1 - 0.02% Coverage
Definitely.

<Files\Audio Interview with Student B> - § 1 reference coded [0.06% Coverage]
Reference 1 - 0.06% Coverage
Yeah, most definitely.

<Files\Audio Interview with Student K> - § 1 reference coded [0.16% Coverage]
Reference 1 - 0.16% Coverage
By implementing these principles, it could really work to our benefit.

Furthermore, results imply enhancement in learning, specifically in the following ways:

5.7.2.1 Access

Access was the highest ranked factor. This is a logical argument as UDI is all about improving access. Access would hence be improved in the following ways:

a) Accommodation of Diverse Needs

Students believe that the implementation of UDI principles will definitely enhance learning that will help them become more involved in their studies. Students acknowledged that UDI allowed flexibility to use specific capabilities to maximise their understanding, or switch to a more adaptable format such as Braille. This will ensure that students spend less time trying to source appropriate formats for notes and more time engaging with the course material. Students agreed that compliance was needed and welcomed UDI implementation:

<Files\Audio Interview with Student K> - § 1 reference coded [1.00% Coverage]
Reference 1 - 1.00% Coverage

You now become more involved in the lectures more involved, course material, because it's not all available to you, in whichever format suits you. If today, you want to listen to it tomorrow you want to use the braille or you know, to read it with your fingers. I mean, they are students that use braille, whichever you prefer, then that makes you comfortable with the study material. You can access that accommodation and use it, and that's...

<Files\\Audio Interview with Student L> - § 1 reference coded [0.62% Coverage]

Reference 1 - 0.62% Coverage

Well, I think that there will be very, very, very helpful to ask, won't have to waste time trying to find a good format for our notes we just have to engage our material and do our best. I think it's a very, I think it's a very useful program. And I think diversity should embrace it to be compliant with.

<Files\\Audio Interview with Student Q> - § 1 reference coded [0.77% Coverage]

Reference 1 - 0.77% Coverage

You need to be able to walk into your lecture room, and sit down and be able to have everything at your disposal. So it should be available immediately. So if you are a Braille reader, they should have a Braille paper for you to follow the lecture, you know, because everyone must be on the same level when you sitting in the classroom.

Students accept that it will be more comfortable having flexibility in accessing course materials in the most suitable formats. Students entering the system have limited knowledge and exposure to technology and sophisticated websites exclude them (Subbiah, 2020). Therefore, UDI is appropriate as it simplifies the design to provide easier access to assistive technology/devices and teaching methods (Ngubane-Nokiwa 2016). Students believe that UDI principles allowed them to learn from their mistakes and apply their full potential, thereby improving retention and throughput.

b) Ease of Use

Universal Design of Instruction implementation was favourably accepted by several SWVDs as it placed them on par with their sighted counterparts in the classroom:

<Files\\Audio Interview with Student D> - § 1 reference coded [0.28% Coverage]

Reference 1 - 0.28% Coverage

Easy to use user-friendly so it would be it would make our lives much easier academically.

<Files\\Audio Interview with Student G> - § 1 reference coded [0.48% Coverage]

Reference 1 - 0.48% Coverage

I think when there are alot of alternatives you can choose then you are comfortable in so, in that way. In that way you, since you are comfortable in the way you doing it you will accept doing the work.

<Files\\Audio Interview with Student K> - § 1 reference coded [0.16% Coverage]

Reference 1 - 0.16% Coverage

Well, it will, it will help me to access my course materials much easier.

The consensus view of students is supported by Izzo (2012) in that UDI principles incorporated course designs with universally designed assistive technology that will provide SWVDs with options to access the content multiple times as required and in different settings with the availability of a variety of technological applications.

c) Fully Functional Classroom/Online/Time

Whereas, the lack of optimal conditions for learning seriously disadvantaged SWVDs, but Universal Design of Instruction offers online lectures and technology that provide a variety of technological applications, giving students access to lectures anytime and at any place. This enabled students to spend more time engaging with the content than having to secure accommodations for themselves, which was time-consuming. The following student responses revealed that they are cognisant of the advantages of a fully functional classroom that UDI principles assured and have expressed how it will optimise accessibility to meet their diverse learning needs:

<Files\Audio Interview with Student A> - § 1 reference coded [1.04% Coverage]

Reference 1 - 1.04% Coverage

so what UDI will DO is that when you walk into the classroom it will have everything that you need, to listen to the lecturer you will already have the notes setup on your computer for so that you can go to that desk, sit at that desk. You got the notes all on your screen and you can listen to it and engage with the lecturer whatever they saying, what the students are saying, you know and you will be listening to it and all the apparatus and all the materials that you need will be all be ready and prepared for you in the classroom.

<Files\Audio Interview with Student B> - § 1 reference coded [0.62% Coverage]

Reference 1 - 0.62% Coverage

Okay, I'd say so first of all, for all the class for every lecture to be online, they can be in the lecture hall its fine but if I want to view the class to be in that lecture in the comfort of my residence I think that would be better, cos yah.

<Files\Audio Interview with Student K> - § 1 reference coded [0.37% Coverage]

Reference 1 - 0.37% Coverage

Because time is a major issue for most students. It's time consuming to go around doing these things if it's not prepared for you. It's not already there for you.

Research by Pearson and Koppi (2002) has shown that careful and inclusive planning of activities is necessary as many barriers to accessibility result from design issues. Several studies correspond with students' suggestions that the implementation of UDI at the university is the key to providing access because it requires understanding in context, flexible learning methods, provides online technologies and allows participation without prejudice, fostering independence and improved communication (Ngubane-Nokiwa, 2016; Heylighen, 2014 and Pearson and Koppi, 2002).

5.7.2.2 Equity and Equality

This was the second highest ranked factor and also a logical argument as UDI is meant to promote equality for all.

a) Equal Levels

Several students agreed that without the implementation of UDI they would fall behind in their studies because they will not be able to participate and compete on an equal level with others in the classroom to obtain their set goals:

<Files\Audio Interview with Student D> - § 1 reference coded [0.58% Coverage]

Reference 1 - 0.58% Coverage

Yes, that's what I'm trying to say. Like we are falling behind and so we wouldn't have to fall behind if that was implemented, right. Would be on the same level as all other learners. Yes.

<Files\Audio Interview with Student E> - § 1 reference coded [0.67% Coverage]

Reference 1 - 0.67% Coverage

Yes, I think. Yes, I think it will actually put everybody in the same level. Cos the argument here is not that persons with disabilities must be given a better chance than others, no but an equal chance.

<Files\Audio Interview with Student F> - § 1 reference coded [1.17% Coverage]

Reference 1 - 1.17% Coverage

I feel, so I feel UDI implementation in UKZN will allow for bridging the gap between students with visual disabilities, with visual impairments to students that have no visual disability. Some of the information will be on the same level; they will not be a discrepancy between students with visual

disabilities and students with non-visual disabilities. They will be able to compete on the same level and reach the same level as UKZN is trying to achieve.

Addressing inequalities requires a barrier-free curriculum with accommodations that are critical to ensure inclusive educational practice for SWVDs (Ntombela, 2013). Adopting flexible approaches to educate diverse learners, such as the implementation of UDI, will provide SWVDs opportunities to obtain the academic standards on the same level as able-bodied students (Vickerman and Blundell, 2010).

b) Break Barriers

Students reflect great enthusiasm in support of a more flexible system that will enable them to participate on par with other students in the classroom. Students are confident that the implementation of UDI will advance their potential to achieve and improve in their studies:

<Files\Audio Interview with Student G> - § 1 reference coded [0.64% Coverage]

Reference 1 - 0.64% Coverage

Of course it will because it helps to worry about how learners, how other students are feeling about you and you lose focus of, of what you came to do but if the principles were, if the principle was implemented at the university, we all will be learning at the same time.

<Files\Audio Interview with Student N> - § 1 reference coded [1.46% Coverage]

Reference 1 - 1.46% Coverage

Yeah, yeah I think it will enhance very better very better even in my case if these principles were really applied in the institutions I don't think I would ever had to repeat even one module in the institution. So for others I think it will best because the fact that we have managed to introduce which means we have that potential but there are only barriers which enables which prevents us from accessing our full potential on learning in this institution so if these principles maybe implemented I think it will improve more.

Universal Design of Instruction provides various strategies such as multi-modal teaching and differentiated instruction that eliminate barriers and help students with a diversity of learning needs to access equitable education and succeed at university (Izzo, 2012).

c) Participation

The general view of students provided confirmatory evidence that they experience difficulty participating in the lesson, which results in feeling like they are not part of the classroom compounded by the fact that they struggle to keep up with other students. As a result, students showed confidence in UDI to rectify such discrepancies:

<Files\\Audio Interview with Student C> - § 2 references coded [0.31% Coverage]

Reference 1 - 0.21% Coverage

Because I will participate more and feel part of the classroom.

Reference 2 - 0.11% Coverage

Feel like I belong in the class.

<Files\\Audio Interview with Student M> - § 1 reference coded [0.66% Coverage]

Reference 1 - 0.66% Coverage

I think ehhehh the lesson will be more fruitful; I think it will be easier for students to be engaged with other students they were learning the same thing they have the same thing so if the student is lacking or didn't understand something the student can engage with other students.

On these grounds, one can argue that in order to meet those challenges calls for new priorities in education that embrace a new balance in teaching and curriculum (Tomozii&Topală, 2014). Accordingly, the model for instruction that this study conceptualised is that of UDI which promotes inclusivity through equal participation fostering belonging, confidence and esteem.

d) Inclusive

Despite HEIs having a legal obligation to include SWVDs, much of the conversations of students depict that they still face many barriers in HE, such as inaccessible learning material, lack of knowledge and expertise of staff, compounded by the negative attitudes of staff and students.

<Files\\Audio Interview with Student L> - § 1 reference coded [0.86% Coverage]

Reference 1 - 0.86% Coverage

Well, it would enhance, I wouldn't have to feel that I am different to other students' cos that's the problem with us visual impairment student, we do feel as if we are different in terms of our intellectual capacity with others. So if the planning system would be, would be inclusive I feel you won't have to

feel different and you won't have to feel different when you at the classroom or doing your studies alone. You know.

<Files\Audio Interview with Student O> - § 1 reference coded [0.24% Coverage]

Reference 1 - 0.24% Coverage

Yes, it will fully, if they fully competent then everybody would be ablecos there's no problem.

Hewett et al. (2018) confirmed that due to the barriers SWVDs have demonstrated in their arguments, it is necessary for this HEI to review their models of support. As such, the implementation of UDI will ensure that students are able to follow the flow of a lecture, benefit from the provision of accessible material in advance and make positive individual adjustments that form part of inclusive pedagogy (Hewett et al., 2018).

5.7.2.3 Better Academic Performance

Better academic performance was highly noted by respondents if UDI was implemented.

<Files\Audio Interview with Student A> - § 1 reference coded [0.48% Coverage]

Reference 1 - 0.48% Coverage

It would much more easier for us students with disabilities with visual impairment to to basically achieve the best academic performance as we can because the strain that we take sometimes do affect us and our grades, so it will really really help.

<Files\Audio Interview with Student K> - § 2 references coded [0.37% Coverage]

Reference 1 - 0.27% Coverage

Because it would not only help students with visual disabilities, it would open the door for everyone to perform well.

<Files\Audio Interview with Student M> - § 2 references coded [1.55% Coverage]

Reference 1 - 1.02% Coverage

I think my performance will be much better cos I believe that if you have confidence in class everything is run smoothly and as I said to you that my self-esteem was low so I lost confidence that is why my performance is keep on dropping. So, if if I was having confidence I will not be dropping then my performance will be much better I will be able to participate in class and deal with the work so I think my performance will be much better.

Several students indicated that the successful implementation of UDI at the university will greatly improve confidence, self-esteem and overall performance. Heylighen (2014) justified the foregoing student debate that applying the UDI principles creates independence, self-

reliance and individualism for SWVDs. However, this will be heavily reliant on accessible systems, reliable methods of instruction and enabling classroom environments that provide freedom of choice and enhanced the ability of the individual to live independently (Heylighen, 2014).

5.7.2.4 Attendance and Throughput

The students displayed a sense of low morale and reluctance to attend class as SWVDs have faced enormous obstacles to proceed with their education competently like other students (Temesgen, 2018). It is evident from their utterances that no alternatives were in place, demonstrating a lack of adequate and appropriate support to retain and to reduce dropout rates at university:

<Files\Audio Interview with Student A> - § 3 references coded [1.00% Coverage]

Reference 1 - 0.13% Coverage

And I think more, I think attendance also will improve in class.

Reference 2 - 0.67% Coverage

Because I know just a few of my friends who will be like what is the use of me attending class because I can't really, I can't see the notes and at the end of the day I am expected to perform, umhh, to perform well like any other student they would prefer to wait for the notes at the end of the week. I think attending will also improve, umh yah.

<Files\Audio Interview with Student E> - § 1 reference coded [0.99% Coverage]

Reference 1 - 0.99% Coverage

Um, it will increase quality of the service being delivered and it will ensure better throughputs, better throughputs but also it will also make because the service could be quality but if the person receiving the service is having all these challenges trust me you are not going to get a quality output.

Students reported that one of the major educational challenges of SWVDs has been poor service delivery in terms of the provision of adapted materials. Temesgen (2018) is in favour of the students' argument that the university needs to adapt teaching and learning materials to improve performance, retention and throughput. It is therefore crucial that the university fulfil their obligation to provide inclusive learning environments and explore strategies to development and nurture the learning of SWVDs (Hewett et al., 2018). A system such as UDI explores such challenges to find an appropriate balance between creating an inclusive learning

environment and establishing where to make specific adjustments to meet the individual needs of SWVDs by working in collaboration with the learner (Hewett et al., 2018).

5.7.2.5 Knowledge gain/ Focus and Understanding

Conversations from various interviews with SWVDs revealed a sense of acceptance from the respondents that HEIs face a complex challenge in making reasonable adjustments to enable them to fully participate in the classroom. Several students anticipate that a UDI system will facilitate knowledge gain; enhanced focus on learning as everybody will be catered for; and will cultivate understanding that will help SWVDs achieve:

<Files\Audio Interview with Student D> - § 1 reference coded [0.76% Coverage]

Reference 1 - 0.76% Coverage

It would be easier for us to gain more knowledge in the classroom than rather like me, for example, going back, like when I've had a lecture, I need to go back and study on my own and see what the lecturer was trying to say or do in the classroom.

<Files\Audio Interview with Student E> - § 1 reference coded [0.14% Coverage]

Reference 1 - 0.14% Coverage

Yes, learning will be too much advanced.

<Files\Audio Interview with Student G> - § 1 reference coded [0.46% Coverage]

Reference 1 - 0.46% Coverage

I think it will make it better by, I think, if UDI is implemented our main focus, all students, our main focus will be learning because everybody is catered for so our focus will be learning.

Hewett et al.(2018) inferred that to provide an inclusive learning environment, the university needs to take action to fulfil their obligation to provide an inclusive learning environment. Furthermore, the university needs to be in readiness for SWVDs by exploring strategies to improve the skills of the students once at university. Tomozii and Topală (2014) agreed that the answer to acknowledging the need for new educational perspectives required the ability to be aware, curious as well as interested in learning by recognizing multiple perspectives that should be implemented and understanding which are the best practices that can help all stakeholders within the HEI. This sets the stage for the implementation of UDI at the university.

5.7.3 Factors for the Implementation of UDI to Promote Inclusive Learning

This key sub-theme examined the factors necessary for implementing UDI for SWVDs.

5.7.3.1 Possibility of UDI to be Implemented at the University

Most respondents believed that it was possible for the university to implement UDI:

<Files\Audio Interview with Student B> - § 1 reference coded [0.08% Coverage]

Reference 1 - 0.08% Coverage

Yeah, it can, definitely it can.

<Files\Audio Interview with Student D> - § 1 reference coded [0.25% Coverage]

Reference 1 - 0.25% Coverage

It's not too much. It is. It is. It is possible for it to be implemented at UKZN.

<Files\Audio Interview with Student F> - § 1 reference coded [0.59% Coverage]

Reference 1 - 0.59% Coverage

I do highly think it's possible, however I do feel it will be challenged by UKZN, yes, it will take a lot for the university to implement UDI. I don't think it's something they want to implement in the near future.

<Files\Audio Interview with Student G> - § 1 reference coded [0.19% Coverage]

Reference 1 - 0.19% Coverage

Maybe it will happen but it won't be an immediate thing maybe it will take years.

Furthermore, specific factors for implementation are classified below.

a) Culture Change

Student respondents divulged the injustices they faced when lecturers did not adopt positive strategies and did not conform to universal teaching practices. Students felt compelled to adapt to the status quo when lecturers displayed reluctance to change and did not provide SWVDs with individual support to access an inaccessible mainstream setting that remains in essence unchanged.

<Files\Audio Interview with Student G> - § 2 references coded [1.02% Coverage]

Reference 1 - 0.67% Coverage

Think like most of them, I think like because lecturers are used to doing things in a certain way and it's very hard to move from what you used to do to something new and with the stereotypes. It's very hard to teach like, an adult something new and they implement it in their lives.

Reference 2 - 0.35% Coverage

I feel that, I feel that when they were first introducing it they didn't put people with disability to mind so we just have to adapt with everything.

It was explained in Vickerman and Blundell (2010) that the university is required to empower SWVDs to advocate their views and strategise to meet individual needs instead of expecting SWVDs to adapt to the current status quo and fit **into** existing practices. Students emphasise that it is pivotal that the university consult more widely with SWVDs to recognize what supports are required, thereby embracing a positive culture that address potential barriers to learning early in their higher educational journey (Vickerman & Blundell, 2010).

b) Holistic Efforts

To facilitate learning for SWVDs requires collaborative efforts from all stakeholders involved. Students suggest that a better system is required to allow for consultation with various trained personnel at the university to tackle the issues concerning accommodations for SWVDs.

<Files\\Audio Interview with Student O> - § 1 reference coded [1.02% Coverage]

Reference 1 - 1.02% Coverage

They can because in varsities there are people who are trained to work with, who are trained to work with everybody, so if they can unite they can be able to come out they will be able to accommodate anyone because they all have the knowledge which is required. And the person who is doing psychology; a person who is being helped. Who is trained can come up with something cos you are learning with persons with disability.

c) Look Beyond Cost /Prioritise

Students believe that the provision of equal access and strategies to provide the necessary structure to accommodate all students fairly is possible. However, it requires that the university look beyond cost and prioritise the needs of its most vulnerable students. Students

attest to the fact that there have been persistent deliberations about cost implications that dissuade the university from considering the implementation of a better system of support and a more inclusive learning environment:

<Files\Audio Interview with Student L> - § 1 reference coded [0.70% Coverage]

Reference 1 - 0.70% Coverage

Well I do feel like it's really, it's possible. Yeah, it's really possible for it to happen. They will hide behind some costs cos they will always do that; tell you about costs and all those. But At the end the education must be available to all. So I don't think there is any other way that they can do, they have to implement it, it is possible.

<Files\Audio Interview with Student F> - § 1 reference coded [0.85% Coverage]

Reference 1 - 0.85% Coverage

It was, it was rather sad. So taking that there, I mean prepare a quiz for a student to to complete eh to complete eh to ensure fairness and equality in a university which was such an issue. Um, here you gonna be spending eh you know huge sums of money eh I feel it will not be done without a lot of fighting, a lot of motivation.

The implementation of UDI can help the university meet challenges with new priorities in education and a stronger emphasis on creating a balance in teaching and curriculum development (Tomozii & Topală, 2014). However, Ngubane-Mokiwa (2016) conceded that one of the causes for not including the accessibility feature was due to its increasing costs.

d) Goal-orientated/ Needs/ Implementation versus Intention

Students believe that the university is aware of the problems that SWVDs face and that UDI principles could foster a system that will meet the requirements of the growing diversity of students in the classroom. There is a level of willingness and intention to make required accommodations and adjustments to the curriculum that some students have identified. As a result, they feel confident that the implementation of UDI will help them accomplish their goals.

<Files\Audio Interview with Student J> - § 1 reference coded [0.78% Coverage]

Reference 1 - 0.78% Coverage

Yes, I think it is, the principle will work because they know there are some students with those problems so the principles, if the principles were working it will help everyone be more comfortable in the learning process, not to be left behind. So they have to use the principles so that no one can have any problems with his or her study.

<Files\Audio Interview with Student E

Reference 1 - 0.39% Coverage

Actually I can see the intention too but the implementation is not so good but there is willingness there is intention.

<Files\Audio Interview with Student A> - § 1 reference coded [0.35% Coverage]

Reference 1 - 0.35% Coverage

I'm saying yes I really do. I mean there is, I don't think it's impossible, people who are who are eager to see their goal through so I think it is possible and it will help a lot.

Hewett et al.(2018) agreed with students that it is possible to embrace a new educational perspective such as UDI. However, to facilitate its implementation required a period of learning and knowledge acquisition by all stakeholders regarding the accommodation of diverse student populations at HEIs.

5.7.3.2 Accessible Course Design

This sub-theme established the important aspects or factors that should be considered in implementing a more accessible (flexible) course design that would benefit learning for SWVDs. This was done in relation to the seven UDI principles. The following were the most highly ranked:

a) Equitable use

This was the highest ranked factor and was informed by the following.

❖ Equity

Students believe that the idea of a Universal Design of Instruction is far-fetched, claiming that in many years of studying at UKZN, they have not encountered such an approach to inclusive education. Modules are designed with little thought given to the removal of barriers to the participation of SWVDs when the goal should be equal access and non-discrimination. Students found that the modules are discriminatory towards SWVDs as they were not designed with consideration of the views of SWVDs in the classroom.

<Files\Audio Interview with Student F> - § 1 reference coded [1.40% Coverage]

Reference 1 - 1.40% Coverage

It does really it does get to you at times when you are not heard and um like I've said something like what I've just said to you on the implementation of UDI being a farfetched idea in the near future if I did not encounter what I've encountered over the past three and half years or so at UKZN. So it does get to you personally, and you start to accept that yeah, nothing can be done and it really messes your perception of life and equality, or achieving a quality of students with normal with no disabilities whatsoever, it does affect you.

<Files\Audio Interview with Student L> - § 1 reference coded [1.20% Coverage]

Reference 1 - 1.20% Coverage

Well, I think what they can do is the design of the module should not only be thinking about someone who is not disabled. When the designing of the module, it should also be taken into consideration are students who are visually impaired. I think if they can do that we can find that the module is not discriminative towards students with visual impairment. But when they design a module for a student who is fully sighted, we will always be left behind because there will be those after that they won't include because they design the module with student who is not disabled in their minds.

Burgstahler (2017) explained that Universal Design of Instruction requires not only designing teaching and curriculum adjustments for the average user, but also for students with a broad range of abilities, disabilities, ages, reading levels, learning styles, languages, cultures, and other characteristics. Designing inclusive educational practice for SWVDs will ensure that courses are accessible and more usable by everyone. As such, it will minimise the need for special accommodations for those who need it.

❖ Engagement

Bhattacharya (2017) explained that to keep students engaged required providing flexibility in the way information is presented. Students with visual disabilities no longer want to feel disadvantaged. They want to engage in the lesson at the same level as other students in the classroom.

<Files\Audio Interview with Student F> - § 1 reference coded [0.67% Coverage]

Reference 1 - 0.67% Coverage

Once that is done it increases learner engagement so, students with visual disabilities are no longer sitting there saying you know what that I am at a disadvantage, here. We on par with each other so I am going to be able to engage at the same level as my peers

Due to learners varying in their capacity to process information, UDI implementation will be beneficial to SWVDs as it provides multiple means of representation, action, expression and engagement for a more accessible course design (Burgstaulher, 2015)

❖ Online learning/ Reformatting Software

The Universal Design of Instruction allows for online learning which avails different media and formats to SWVDs because new digital technology provides more options for presenting information, creative expression and engagement (Bhattacharya, 2017). Students felt that it allowed for the recording of lectures, which significantly reduced having to decode and read words. Students complained that materials are not always compatible with the available software and explained how it would make learning easier and more accessible if it aligned with the preferred software.

<Files\\Audio Interview with Student B> - § 1 reference coded [0.96% Coverage]

Reference 1 - 0.96% Coverage

Oh, yeah, I think I think this would be okay. You know, the implementation of online learning, I think it is quite, it made our learning a little bit more easier, because now we're using WIFI in our class using zoom. So I think there are quite easy because they could, they could record the classes. And then you can you could go on to mobile and access their pre recorded lecture

<Files\\Audio Interview with Student K> - § 1 reference coded [0.18% Coverage]

Reference 1 - 0.18% Coverage

First of all they should align their course material to be compatible with JAWS.

b) Flexibility in Use

This was also another high ranked factor.

❖ Different backgrounds and experiences

Students come to university from different backgrounds and with varying degrees of knowledge and experience and might not always have the necessary skills to be able to use advanced specialised assistive technologies. As a result, UDI challenges educators to re-think

the nature of their curriculum and whether it allows flexibility to serve a diverse population of learners (Izzo, 2012).

<Files\Audio Interview with Student A> - § 1 reference coded [1.07% Coverage]

Reference 1 - 1.07% Coverage

I think the first thing they have to consider is that, we, I-I—I'll talk, I'll speak of first year student. I think they have to consider that we do not come from the same background, so off course you won't be able to grasp the things in the same normal way. There are students who have never used a computer before, and also you know and who will never be able to in a psychological manner, in an incident there are 2 students who are struggling and anyone can react differently and considering that we are all different and have different experiences

Roberts et al.(2011) suggested applicable methods that allow for lectures, discussions, individual and group activities. Pearson and Koppi (2002) asserted that one cannot be expected to always meet all the needs of every learner. However, a UDI system can ensure the widest participation. Heylighen (2014:pg. 8) agreed that although it is: “impossible to design for everyone, designing for inclusion provides the opportunity to develop accessible courses to be usable by all to the greatest extent possible”.

c) Size and Space for Approach and Use

Students are experiencing difficulty accessing appropriate seating within the classroom. A flexible classroom needs to ensure that there is adequate and appropriate workspace for students who may require specific seating arrangements to enable them to view the chalkboard or projector screen, as well as for the accessibility of wheelchair users.

<Files\Audio Interview with Student K> - § 2 references coded [0.73% Coverage]

Reference 1 - 0.28% Coverage

Like in most cases, can they just leave like at least three spaces, or two spaces? Just the end of the seat, just each seat.

Reference 2 - 0.45% Coverage

Oh, because if you go to a supermarket, and they have disability parking right at the front, so that they make it easier for those people with wheelchairs to, to get their wheelchairs out of the vehicle.

Designing for independence, self-reliance and individualism is characteristic of UDI. However, in applying UDI principles, one needs to be cognisant of the diversity of

human abilities and conditions and choose the most appropriate design within the context of the classroom (Heylighen, 2014). Robert et al.(2011) suggested that to overcome barriers caused due to seating,one could adopt circular seating arrangements.

d) Tolerance for Error

Students have highlighted that there are several instances where unintentional errors can occur due to an inaccessible mainstream system. For instance, content has to be reformatted at the DSU,which will cause submission delays for assignments; students may not be familiar with assistive digital devices; and it is challenging to access information from the university Library due to books and resources being in inaccessible formats.

<Files\\Audio Interview with Student N> - § 1 reference coded [2.78% Coverage]

Reference 1 - 2.78% Coverage

But not be penalised for on that on that principle I think they are more harsher cos they do not like usually say that you are in like in the disability unit and you are maybe learn a slide so you can submit on this date and the others can submit on that date cos they understand that you may not have the time to complete on time cos you need more time to write things cos if we were writing on the paper like we are using now our hands maybe we would have passed but if like cos right now we are typing using digital devices, which it makes it harder for us. They must consider the issue for us so if we made a mistake right now but we are getting penalise for that. So I think on that principle but on that other principles like making the information accessible like getting there information in the campus library, so it maybe harder for accessibility for visual disability to make those research there and to access those articles there so you need to be carefully thought how to access UKZN library.

Students are in favour of a UDI system as it minimizes hazards and the adverse consequences of accidental or unintended actions (Burgsthaler, 2015). Burgsthaler (2015) and Robert et al. (2011) advised that to aid in accidental or unintended actions, feedback should be continuous to learn from unintentional mistakes. Furthermore, computer programs need to automatically save documents to prevent accidental loss of work and provide the necessary guidance to alert SWVDs to inappropriate responses.

5.8 Theme Four:Frameworks

This primary sub-theme examines the frameworks and determines the applicability of the results to the frameworks. The frameworks will inform the intended UDI model based on the results.

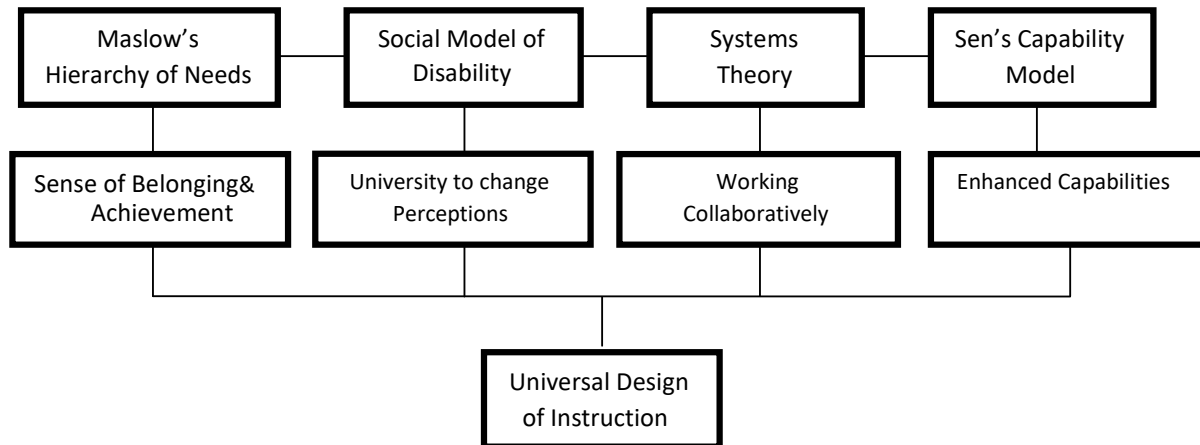


Figure 5. 18: How the Frameworks Inform UDI

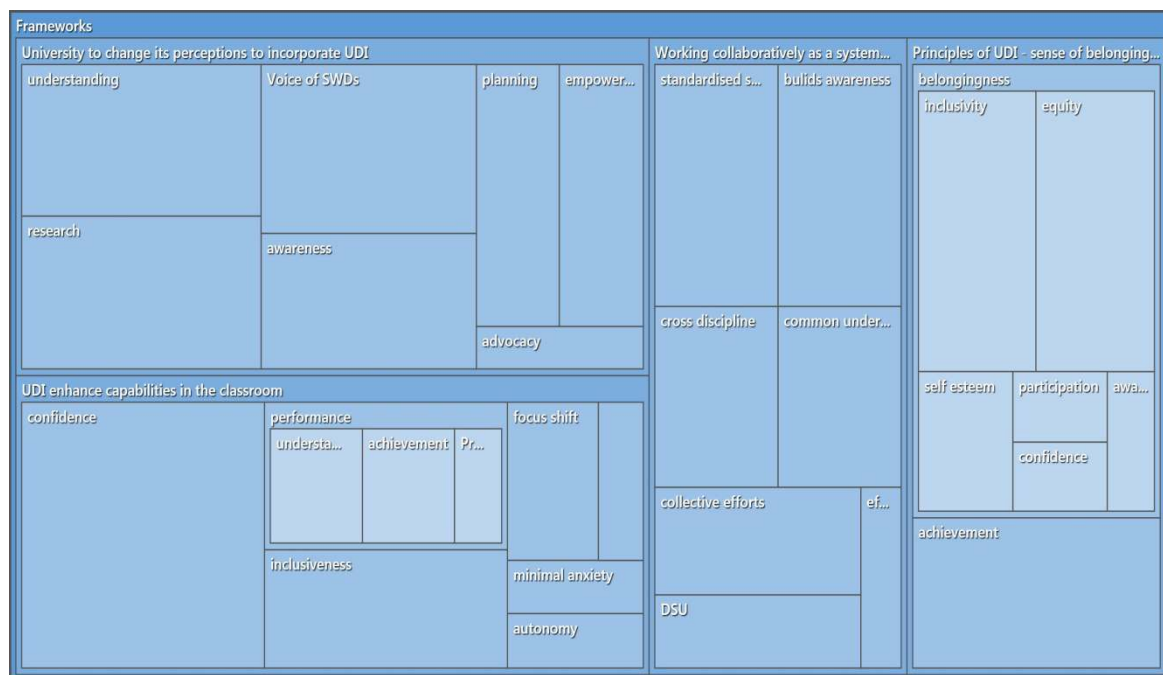


Figure 5. 19: Hierarchical Chart of the Frameworks

5.8.1 University to Change its Perceptions to Incorporate UDI

This sub-theme examined how the university should change its perceptions in order to incorporate UDI.

5.8.1.1 Understanding

Students believe that there is a general lack amongst understanding of the university community about the diversity of students sharing the same space at the university. They are concerned that nobody understands what they go through:

<Files\Audio Interview with Student A> - § 1 reference coded [0.35% Coverage]

Reference 1 - 0.35% Coverage

I think making them understand that there are other student who are occupying the same space as them and we are all in for one goal and making them understand that we are not really.

<Files\Audio Interview with Student F> - § 1 reference coded [0.65% Coverage]

Reference 1 - 0.65% Coverage

No one knows, no one knows what I go through behind these glasses and they don't know what I feel through these eyes which is why I don't feel stigmatised, and yeah and I do feel if people did know how severe my visual disability was then I will be in time...

Students have suggested that the university needs to adjust the manner in which they approach the services of the DSU. Since UDI motivates for adequate interventions toward full participation within the HEIs, SWVDs feel the need to increase the staff complement that services SWVDs at the DSU because DSU staff understand their needs better:

<Files\Audio Interview with Student N> - § 1 reference coded [1.57% Coverage]

Reference 1 - 1.57% Coverage

think the university can start by adjusting the manner in which the disability office works by assisting the student like having the other as having more staff there to assist the students, who understand them better than those who are there, they usually take people without disability. They expect them to understand us with disability. I think like if they implement like if they employ the staff that it will start there so that they will we can be understood by people who I think are like us who understand who understand how we usually cope with the study.

Parashar et al.(2008) support the fact that improved understanding will help change perceptions. Furthermore, understanding attitudes towards SWVDs has widespread advantages given that such attitudes define life experiences, opportunities and influences help-seeking behaviours of SWVDs. It is for this reason that this study motivates for UDI implementation as it provides an important opportunity to advance the understanding of problems and challenges in relation to knowledge delivery and learning.

5.8.1.2 Voice of SWVD

Several students want their voices to be heard at meetings concerning the needs of students with visual disabilities. Students believe that knowledge of the lived experiences of SWVDs can only be explained from the perspective of those students and someone who knows what they go through:

<Files\Audio Interview with Student D> - § 1 reference coded [1.00% Coverage]

Reference 1 - 1.00% Coverage

Definitely, definitely someone or who understands and someone who knows what we go through, our challenges as students with disability is what needs to be in that meeting, because they will have a better understanding and knowledge, and they would be able to share that or to raise their views or our concerns with management.

<Files\Audio Interview with Student F> - § 1 reference coded [1.31% Coverage]

Reference 1 - 1.31% Coverage

I would say have a panel, have a panel that will sit down with students from the, from the disability support unit and hear some of their problems, hear directly from them and um when I say have a panel, have a panel of senior staff members that are above your teaching and learning staff members. Because it is these staff member that we took our problems to and nothing was done and we were challenged like we were students without any visual disabilities or any disabilities whatsoever and treated unfairly.

<Files\Audio Interview with Student M> - § 2 references coded [0.40% Coverage]

Reference 2 - 0.22% Coverage

Student should complain or make their voices heard about the problems they are going through.

The judgements and feedback made by SWVDs themselves about the usability of the educational design will aid in the understanding of the challenges they experience to the greatest extent possible (Heylighen, 2014). Vickerman and Blundell (2010) asserted that to support inclusivity requires hearing the voices of SWVDs. Therefore, students suggested that the panel of members that sit to discuss disability related issues need to hear it directly from the voices of the SWVDs.

The principles of UDI and the Social Model are consistent with this approach (Burgstahler, 2013). In support, Heylighen (2014) and Vickerman and Blundell (2010) stated that hearing the voices and lived experiences of SWVDs is key to answering the question about who decides whether it can be used by all people and should be seen as the central

tenant to successfully understand the needs of SVWDs. This would prompt HEIs to proactively approach and empower SWVDs to advocate their views.

5.8.1.3 Awareness/ Empowerment

If the university aimed to be diverse, there is no need for a DSU. Confining SWVDs to the use of the services of the DSU is isolating and segregating students, placing emphasis on them as students with visual disabilities, which does not support belonging and inclusivity as Maslow (1943/54) promoted. Empowering SWVDs to advocate their views would change perceptions and help create awareness and understanding of their need for accommodations, which will ultimately help them reach their goals. Student respondents argued that although lecturers, students and staff may not understand the experiences from the perspective of SWVDs, having workshops for all involved will advance their understanding and acceptance of SWVDs amongst them.

<Files\Audio Interview with Student L> - § 1 reference coded [0.65% Coverage]

Reference 1

Well, for starters I do not think that, if the university is really aiming to be diverse they shouldn't have those places like the disability unit. Because now you believe you belong to disabled. You should walk in to the university be oriented the way that you feel like you are belonging to the varsity environment.

<Files\Audio Interview with Student P> - § 1 reference coded [0.36% Coverage]

Reference 1 - 0.36% Coverage

Okay, so, so basically, awareness would, would change the perspective or the perception so that they may incorporate the UDI principles.

<Files\Audio Interview with Student A> - § 1 reference coded [1.02% Coverage]

Reference 1 - 1.02% Coverage

So, I think having I don't know workshops could help just to make people understand although they won't experience what we feel but just to let them know we are here and when things happen, when we feel we can not feel like we belong and you know when you tell them such things makes us feel out of place and really accommodated maybe there are people who will be cogent that will stand with us and understand us to help us reach the goal. I think maybe workshops for everyone from the lecturers to the students and to the staff.

Other student respondents suggested that conferencing and experiential learning could help empower students to improve current conditions for SWVDs. Heylighen (2014) suggested

that inputs from the experiences of SWVDs themselves were imperative to overcome design issues supported by students who are unrelenting with regard to SWVDs being included in disability related issues, contained in the phrase “nothing for us without us”.

<Files\Audio Interview with Student E> - § 1 reference coded [0.87% Coverage]

Reference 1 - 0.87% Coverage

That we at least have disability conference so we talk and relook with the sector with the beneficiaries of the system cos I really think that experiential learning could help to better things no activist says it better nothing without us, nothing for us without us.

<Files\Audio Interview with Student G> - § 1 reference coded [0.67% Coverage]

Reference 1 - 0.67% Coverage

I think at this point it's very hard to change people's mind but I think like lecturers should receive training of like, to get educated about the different disabilities so when they are doing their notes and whatever they put that into mind, that there are learners with disabilities.

Juklová and Ulrichová (2011) argued that students are passive carriers of the values of the educator and their life experience is not independent of the socio-cultural environment in which the student interacts. Therefore, it is important that SWVDs as well as mainstream students be empowered by awareness initiatives that incorporate experiential learning methods that involve sharing experiences and group reflection. It was suggested by students that educators play a vital role in awareness raising and empowering students. Therefore, lecturers should receive training and be educated about different disabilities and mindful of their needs and aware of their presence in the mainstream.

5.8.1.4 Research

Students believe that academics and staff require doing more research into social circumstances, external conditions and stigmatisation of SWVDs at the university to expand access and advance equality. In addition, to bring about attitudinal change requires research into how to encourage community (university) engagement. This may include involving all stakeholders working collaboratively towards practical interventions such as institutional transformation and classroom diversity.

<Files\Audio Interview with Student C> - § 2 references coded [0.38% Coverage]

Reference 1 - 0.17% Coverage

Oh, I think a university maybe may conduct research.

Reference 2 - 0.21% Coverage

By saying about how we are students with disabilities are coping?

<Files\Audio Interview with Student E> - § 2 references coded [1.70% Coverage]

Reference 1 - 0.60% Coverage

You the academic you do research in this, you can tell me how how, how correct and how good is that, you know umm cos we expanding access to ensure that everybody get equality you know...

Reference 2 - 1.10% Coverage

But, but the research the implementation of it how can we ensure and that and I know that the university does have the community engagement component. How do we ensure that we bring in activism, we bring in civil society to tie and inform because practice should inform, theory should inform practice and practice should inform theory.

<Files\Audio Interview with Student Q> - § 1 reference coded [0.33% Coverage]

Reference 1 - 0.33% Coverage

I think they should, they should um, they should do some research on on maybe some challenges that we are facing, that is how they will know.

Matshedisho (2007) provided evidence that students' arguments are justified as little attempts have been made in terms of policy implementation to address barriers in the current educational system. Stemming from the voices of the students, "theory should inform practice and practice should inform theory". Research outcomes showed a failed response to initiatives to accommodate diversity and equity building towards addressing the full spectrum of learner needs (Matshedisho, 2007). This study embraces the opportunity to provide research evidence that a new UDI model can advance inclusivity and re-conceptualise the experience of impairment.

5.8.1.5 Planning/ Advocacy

Student respondents verified that SWVDs should be involved from the onset in the planning process and agreed with Pearson and Koppi (2002) that barriers to accessibility can be overcome through awareness of design issues. Several students agreed that a universal design system should be incorporated in the planning process and should include the designing of accessible courseware and incorporating strategies that students with various disabilities can take full advantage of.

<Files\Audio Interview with Student E> - § 1 reference coded [0.66% Coverage]

Reference 1 - 0.66% Coverage

I think it starts in the planning, in the universal planning of the organisation. It should be, it should be fully in the planning process not to be incorporated on the way if you get what I am saying.

<Files\Audio Interview with Student P> - § 1 reference coded [0.60% Coverage]

Reference 1 - 0.60% Coverage

I think they should consider maybe they should create notes that are easily accessible, or easy to read. Maybe they ask which font to use and also to a tutorial on how to record or maybe they should record notes, yes record notes.

<Files\Audio Interview with Student A> - § 1 reference coded [1.32% Coverage]

Reference 1 - 1.32% Coverage

Okay, it's a bit hard to tell someone how you feel if they do not experience what you going through, so I'd say in a long shot involving people with visually impairment to advocate, it's really difficult to tell someone how to act in a polite manner towards a person with a disability and trying to make them understand how they feel when they are being disrespected or because they it's something that doesn't fit them so if we make it something that upsets the community, a university community that umm, if one student with disability is discriminated against or is not been able to access some of the materials the university is providing then the whole entire community is affected.

In re-conceptualising a model for diversity, consideration must be given to SWVDs as representative to advocate for the rights of persons with disabilities. Subbiah (2020) confirmed that the empowerment of SWVDs to represent themselves in mainstream society will see the changes that need to be made in HEIs.

5.8.2 Working Collaboratively as a System will Enhance Learning for SWVDs

This sub-theme examined the concept of working collaboratively as a system. It was found that this can enhance learning for SWVDs in the following ways:

5.8.2.1 Standardised systems/ Cross-discipline

If the university community worked together in collaboration of their services within a system that is standardised, it will help SWVDs reach their goals faster. Students believe that it will facilitate interaction and in that way extend their networks and enable them to achieve

individual goals. Furthermore, a standardised system will ensure that all students are on par with each other in the classroom and everybody has the means to achieve on an equal level and not fall behind or feel discriminated against.

<Files\Audio Interview with Student A> - § 2 references coded [1.67% Coverage]

Reference 1 - 0.52% Coverage

I feel like if we use one system to reach a goal, we will reach a goal more faster. We are all in a university community, we are all and I'm talking about students, we are all want to get a degree and later on have something and later on or rather find a good job.

Reference 2 - 1.15% Coverage

As an individual, as a student and someone who is next to me haven't, haven't come across, so our experiences are different. So if we use one system, we will have the same experiences towards you know, but I feel like if we use the same system it will be easier, first of all to interact with one and other, in that way we extend our network and we are able to work together to achieve our individual goals. And with the school having one system it will be much more easier to manage everything and every department and That will make each and everyone's life a little bit easier. Yah, I don't know...

<Files\Audio Interview with Student O> - § 1 reference coded [0.77% Coverage]

Reference 1 - 0.77% Coverage

and the IT person would get the information from these services on how they can make this more suitable for this students. And like if everyone is working together, all that information can combine and even if some person is dealing with..... you can prepare yourself to study effectively, that can play a big role.

<Files\Audio Interview with Student A> - § 1 reference coded [0.49% Coverage]

Reference 1 - 0.49% Coverage

where you talking about your computers, your IT, the libraries, the lecturers, your departments like psychology and sociology and social sciences, if they all work collaboratively do you think that will enhance your learning and just elaborate on that.

<Files\Audio Interview with Student B> - § 1 reference coded [0.29% Coverage]

Reference 1 - 0.29% Coverage

All the departments united to make our lives easier that would be, that would be, that should have a good outcome.

<Files\Audio Interview with Student K> - § 1 reference coded [0.37% Coverage]

Reference 1 - 0.37% Coverage

you would favour everybody working collaboratively in the system to understand disabilities, students with visual disabilities their needs, accommodations, preferences,

By listening to the voice of SWVDs as they reflected on their learning experiences in the classroom it can be surmised that success at degree level and achieving their goal of employability required:

- The joint efforts of all participants in the educational environment;
- Working together in collaboration of their services;
- Providing a standardised system that involves anticipatory adjustments and student support services that focus on personal development, networking and consultation with SWVDs; and
- The empowerment of SWVDs.

However, Vickerman and Blundell (2010) argued that to develop such a system embedded with these characteristics will take some time to achieve.

5.8.2.2 Collective Efforts

Student respondents are of the opinion that if university colleges/faculties, departments and support staff work together in collaboration, it will ensure that the institution is fully aware of the potential of SWVDs. Furthermore, institutions that better understand students' capabilities can use this information to offer appropriate accommodations and make the relevant curriculum adjustments to assist them to improve in their studies and attain their goals. This was conveyed in the following responses:

<Files\Audio Interview with Student C> - § 1 reference coded [0.46% Coverage]

Reference 1 - 0.46% Coverage

Cause if they are aware of us and our challenges that we are facing, work together to improve theand that will help us to perform.

<Files\Audio Interview with Student N> - § 1 reference coded [1.84% Coverage]

Reference 1 - 1.84% Coverage

I think it will enhance even better than before because if those institutions should work collaboratively they would know where the students are coming from and where they are heading to cos they talk about the tutorials as we came in the university, those who were understand us, up to this day they understand our potential. They were able to identify that as we came into the institution if they could

use this information to teach us in the following year, like so if they worked collaboratively together and taking things that will enable us be better in this institution. Yeah, they can improve our studies in this institution if they work together.

<Files\Audio Interview with Student Q> - § 1 reference coded [0.31% Coverage]

Reference 1 - 0.31% Coverage

Oh, I think if they work together they will be able to, they will be able to offer us with assistance that may help us with our study.

5.8.2.3 Common Understanding

Students with visual disabilities complained that they experienced problems communicating requirements for examinations. Although students communicated with the DSU, lecturers and the examinations office, the relevant accommodations were not provided when the SWVDs arrive to write the examination. Students believe that streamlining this process through common understanding and working collaboratively as a system will eliminate the problem and will reduce unnecessary stress during examinations.

<Files\Audio Interview with Student D> - § 1 reference coded [0.76% Coverage]

Reference 1 - 0.76% Coverage

Yes. I definitely think everybody should work collaboratively because they would have better understanding and better knowledge of what they needed to do as lecturers. What support they need to provide as lectures if they work collaboratively. Yes.

<Files\Audio Interview with Student F> - § 1 reference coded [2.04% Coverage]

Reference 1 - 2.04% Coverage

In terms of, in terms of I mean prior to lockdown we had, we had written tests. When we had written tests we had a major issue of streamlining the communications between students, the disability support unit, lecturers and the examinations office. Um you would get and you would have an issue where you will be writing you will send an email in advance: I have a test on a certain date, or an exam on a certain date and I would want the text to be in a large font, you would get to your venue and the paper is not there in large font, so streamlining this and working together as a system, eliminate the problem. You shouldn't have to go through all these processes, and get to your examination room and see your paper is not in the large font it creates so much unnecessary stress on the pupil.

<Files\Audio Interview with Student G> - § 1 reference coded [0.60% Coverage]

Reference 1 - 0.60% Coverage

It will help because everyone will have an understanding of the different disabilities so they will put it in mind whenever they are doing something that they must cater for students with disabilities, making the lives of students with disabilities easier.

Mutual connectedness between all stakeholders within the HEI will optimise the educational experience of SWVDs because working in collaboration will provide a better understanding and knowledge of what SWVDs need and how to best support them (Becvar&Becvar, 2014).

5.8.2.4 Build Awareness

Working collaboratively to service SWVDs will ensure that the requirements of each student will be properly communicated and will alert the relevant section/departments, creating awareness for the provision of optimal conditions for SWVDs. Students alleged that lecturers come to the classroom unaware that there are SWVDs who require specific accommodations to ensure equal participation in the lecture. As such, students believe that if they worked collectively, it will build awareness that will improve conditions for SWVDs in the classroom.

<Files\\Audio Interview with Student J> - § 2 references coded [0.80% Coverage]

Reference 1 - 0.54% Coverage

I think that will be more helpful if they were working together and each other know about, oh ehh if they were communicating properly there will be no problem in the lectures, they will be aware and the learners will be aware of of.....

<Files\\Audio Interview with Student P> - § 1 reference coded [0.85% Coverage]

Reference 1 - 0.85% Coverage

It could have helped because um I think the university I don't know, how they'er collaborating because when lecturers come into class they come and teach not knowing about certain conditions of learners. So if they were working together maybe it could be much more easier and better for students with visual disabilities.

<Files\\Audio Interview with Student Q> - § 1 reference coded [0.39% Coverage]

Reference 1 - 0.39% Coverage

If they work together and if they are aware of my condition then, then I won't have trouble to go around explaining to them so that means I'll have lot of time to study.

Students stated that it is not the responsibility of one office to service students but several offices across multiple divisions of a university. Wessel et al. (2009) confirmed that each

department of the university has a role to play in encouraging the persistence of SWVDs to complete their studies.

5.8.2.5 Disability Services Unit/Efficiency

It is usually time-consuming to have to run everything through the DSU, which would then alert the colleges about the requirements to accommodate SWVDs. Therefore, working collaboratively will reduce the efforts students make in having to repeatedly involve the DSU to ensure that accommodations were provided.

<Files\Audio Interview with Student B> - § 1 reference coded [0.41% Coverage]

Reference 1 - 0.41% Coverage

Well, I think that could be done obviously through the disability unit in collaboration with, in collaboration with all the colleges, I think that's possible.

<Files\Audio Interview with Student D> - § 1 reference coded [0.38% Coverage]

Reference 1 - 0.38% Coverage

Oh, I'd have those working in the disability unit, them having to negotiate and discuss those issues with the management.

<Files\Audio Interview with Student L> - § 1 reference coded [0.84% Coverage]

Reference 1 - 0.84% Coverage

Yeah, I do. It will be really, really, really be useful to be collaborative because you feel like every time even the registration process would delay because you have to run everything through students' disability unit so that it can go in the colleges now, but if we were really, really work with collaboration I don't think that there will be a need for the processes to be time consuming the way it usually is.

Wessel et al.(2009) agreed with the concerns raised by SWVDs that various support systems and programs and several offices across multiple divisions in collaboration with DSU are responsible to assist students to move successfully through the university; to provide academic services to improve access; to advise students about their rights and responsibilities; and provide outreach and consultation to other campus offices and academic units to ensure the full participation of SWVDs (Wessel et al., 2009).

5.8.3 UDI enhancesCapabilities in the Classroom

Results show that UDI will enhance capabilities for SWVDs in the classroom. This was informed by the following factors:

5.8.3.1 Performance

Results imply that performance can be enhanced in the following ways:

a) Understanding of content/ Achievement/ Productive

Students interviewed lay claim to the fact that UDI will enhance capabilities for SWVDs in the classroom as it provides an important opportunity to advance the understanding of content by allowing SWVDs to choose a variety of teaching strategies and providing opportunities for interventions towards full participation (Singh, 2017; WHO, 2015; Denzin & Lincoln, 2013 & Subrayen, 2011).

<Files\\Audio Interview with Student B> - § 1 reference coded [0.36% Coverage]

Reference 1 - 0.36% Coverage

I think it would make a very big difference; it would make us understand the contents more, yeah I think it should be very beneficial to us.

<Files\\Audio Interview with Student Q> - § 1 reference coded [0.17% Coverage]

Reference 1 - 0.17% Coverage

I will, I will understand things better as then I will also perform well.

<Files\\Audio Interview with Student F> - § 1 reference coded [0.51% Coverage]

Reference 1 - 0.51% Coverage

Okay, so I feel that it enhance students with visual disabilities with capabilities because now, they are now able to do much more work that they weren't able to do prior to the implementation of UDI.

Enhanced capabilities reduce the consequences of disability, thus motivating SWVDs to draw on their innate potential to achieve because they will be more productive (Broderick, 2018 and Dubois and Trani, 2009).

5.8.3.2 Confidence

Students with visual disabilities feel confident and are free to achieve more than they would have if excluded when they feel like they belong within the classroom. Fallatah and Syed (2017) confirmed that confidence comes from achievement, participation and encouraging SWVDs to persevere. Therefore, by strengthening confidence, it is likely that SWVDs will be motivated to improve academically. A universal design system can contribute towards effective instructional methods and effective teaching and learning, creating an inclusive classroom that provides opportunities for SWVDs.

<Files\Audio Interview with Student A> - § 1 reference coded [0.51% Coverage]

Reference 1 - 0.51% Coverage

And, also I believe that once a person is confident and has that feeling of belonging in an environment they are able to be free and also be able to achieve more than they would have than when they feel like they are excluded and stuff, so I really do believe that.

Several Student respondents support this view as they experienced challenges and fought against great odds every day. Therefore, students are hopeful that if such a system is implemented, it will promote self-confidence and belief in one's abilities. Hewett et al.(2018) supports this argument as the Capability Approach focused on a notion of freedom related to well-being (capabilities) and agency (empowerment).

<Files\Audio Interview with Student D> - § 2 references coded [0.86% Coverage]

Reference 1 - 0.66% Coverage

Definitely. It would. It would. It would because of the challenges that I have, it's something that I wouldn't have to think about on a daily basis. So I will definitely feel confident in myself and in my studies

<Files\Audio Interview with Student E> - § 1 reference coded [0.61% Coverage]

Reference 1 - 0.61% Coverage

Because they had to fight so many odds, ten times others you know some had to go through dialysis three times a week but still had to study maths and science and for that student to pass

Students conveyed in their dialogues that UDI implementation will create a more positive response to learning in the classroom. Moreover, it will reduce the ever-present stigmatisation that they feel on entering the inaccessible classroom. It will remove the burden of constantly

having to think about what other people are saying about them and having to bear the pain of those hurtful stares from other students in the class.

<Files\Audio Interview with Student F> - § 1 reference coded [1.52% Coverage]

Reference 1 - 1.52% Coverage

And thirdly it will also encourage students with visual disabilities to study more confidently because they are now confident in themselves. Because now they going into these venues not felling like you know, what I'm gonna record this lecture and things are gonna be terrible because I'm going home and I gotta play around with the equaliser just to hear things clearly. You know everything is going to be perfect now. I am going to own the day, I am going to record my lecture, I am going to look at the projector screen, everything is going to be perfect and I'm going to do my work with ease.

<Files\Audio Interview with Student G> - § 1 reference coded [0.33% Coverage]

Reference 1 - 0.33% Coverage

I really think it would, it will boost us because I don't have to think about what other people are saying about me, people staring at me.

<Files\Audio Interview with Student K> - § 1 reference coded [0.21% Coverage]

Reference 1 - 0.21% Coverage

Well there will be a sense of belonging, more like confidence and I'll be able to engage more.

<Files\Audio Interview with Student M> - § 1 reference coded [1.02% Coverage]

Reference 1 - 1.02% Coverage

I think my performance will be much better cos I believe that if you have confidence in classeverything is run smoothly and as I said to you that my self-esteem was low so I lost confidence that is why my performance is keep on dropping. So, if I was having confidence I will not be dropping then my performance will be much better I will be able to participate in class and deal with the work so I think my performance will be much better.

Some students interviewed showed a low morale that resulted in their poor academic performance. However, theyrevealed enthusiasm after understandinghow the seven principles of UDIwith a focus on SWVDs capabilities can help them live comfortably (Mitra, 2006). Students believed that with UDI in place at the institution, it can expand capabilities and thus provide a sense of belonging emphasised by Maslow (1943/54). Belonging stems from the confidence to engage more through full participation and achieve academic success. On a personal level, SWVDs feel that it will enhance self-confident in all aspects of life as a student which will result in overall improvement.

5.8.3.3 Inclusiveness

Inclusivity will place SWVDs on par with the rest of their peers because they do not want to feel different. They want to feel confident to disclose their disability and be all that they can be. Student respondents revealed that they felt they had the same capabilities like other students but with unique needs, and how well they functioned depended on the given opportunities that they are free to choose from (Broderick, 2018). SWVDs believe that they have the capabilities to perform better if they are well equipped with appropriate accommodations.

<Files\Audio Interview with Student D> - § 1 reference coded [0.64% Coverage]

Reference 1 - 0.64% Coverage

I'll feel as a normal human being like, feel normal as everybody not different. Yes. If it was implemented, I do have to disclose my nature. I would, it would make life very much simple. So I feel confident.

<Files\Audio Interview with Student E> - § 2 references coded [0.81% Coverage]

Reference 1 - 0.43% Coverage

Cos persons with disabilities have exactly the same the capabilities as the other it's just that they very unique beautiful needs.

Reference 2 - 0.39% Coverage

Yeah, so I'm saying the implementation of it will help to put everybody on the same footing which is the inclusiveness.

Schiemer (2017) hypothesised that change is necessary to enable systems to become inclusive. Based on the ensuing student discussion, it becomes clear that SWVDs accept that inclusive education is strongly dependent on transformation and embraced the idea of a universally designed system to cater for their unique needs (Schiemer, 2017).

5.8.3.4 Focus Shift/Opportunity

Dubois and Trani (2009) declared that enhancing the capabilities of SWVDs will reduce the consequences of disability. Therefore, the Capability Approach focuses on increasing opportunities for people with disabilities by allowing them to choose among various opportunities to satisfy their basic need for quality education (Dubois & Trani, 2009).

<Files\Audio Interview with Student D> - § 1 reference coded [0.35% Coverage]

Reference 1 - 0.35% Coverage

Yeah, definitely. That'd be less focused on the disability and more focus on the academic work required of me.

<Files\Audio Interview with Student G> - § 1 reference coded [0.37% Coverage]

Reference 1 - 0.37% Coverage

Having to take notes, having to... my only focus will be concentrating in the lecture and taking the important stuff I need to take, gaining the knowledge.

<Files\Audio Interview with Student E> - § 1 reference coded [0.35% Coverage]

Reference 1 - 0.35% Coverage

A sense of chance. A sense of opportunity you know we need that opportunity. Which is fair to your peers?

Student respondents agreed that UDI offers a paradigm shift in disability thinking, necessary to change focus from disability and place more focus on the academic work required of SWVDs. Students on the other hand need to focus more on the important aspects of knowledge acquisition rather than concern themselves with the predicament of an inaccessible environment and restrictive educational design that ultimately places more emphasis on their disability.

5.8.3.5 Minimal Anxiety/ Self Reliance and Capability

UDI allows SWVDs to be who they are, their own person with an identity, and not constantly have to feel anxious to enter a mainstream classroom faced with the stigma of being labelled disabled. Students conveyed that once perceived as a student with disabilities, it creates a mindset that is difficult to change. However, the Capability Approach in conjunction with UDI principles promotes self-reliance, well-being, agency (empowerment) and self-advocacy that give SWVDs the confidence to be who they truly are with the potential to achieve like any other student.

<Files\Audio Interview with Student G> - § 1 reference coded [0.41% Coverage]

Reference 1 - 0.41% Coverage

Yes, I think it would improve because I think I would have, I would not have anxiety of what people are thinking of me and all those things I would just DO what I have to DO.

<Files\\Audio Interview with Student L> - § 1 reference coded [1.37% Coverage]

Reference 1 - 1.37% Coverage

Well I feel, I think UDI can enhance capabilities in the classroom, we can be sometimes we can be really, we are really different as students with visual disability we are different in personality, but I feel like once you are perceive as a student with disability, you will just be grouped as a student with disability and they are not really taken into consideration that there are people who work maybe well when they are alone, others work well together as team members. So I feel like maybe UDI can allow us to be our own person do not feel like whenever you are student with disability you need to be grouped in a particular group. I don't know maybe that makes sense.

5.8.4 Principles of UDI - Sense of Belonging and Achievement

This sub-theme examined the applicability of UDI promoting a sense of belonging. Results imply that it will promote a high degree of belonging in the following ways.

5.8.4.1 Inclusivity

Several students conveyed in their interviews that the implementation of UDI will foster inclusion. It was established from the student comments that since UDI focused on equity and inclusiveness, it was a point of importance for SWVDS who want to be involved and feel a sense of belonging:

<Files\\Audio Interview with Student B> - § 1 reference coded [0.37% Coverage]

Reference 1 - 0.37% Coverage

Because I think as you said it's about inclusivity, so in order for us to feel included in all activity we would need for UDI to be implemented.

<Files\\Audio Interview with Student F> - § 1 reference coded [1.01% Coverage]

Reference 1 - 1.01% Coverage

Yes, yes because that component is taken away in my, with my visual disability because, my visual disability I tend to feel it when it gets to me when I'm sitting down with that paper and trying to read what is on that paper and my vision is affected and eye pressure is completely high and when I'm in that group I'm fine because people doesn't know that I have eye problem or an eye condition.

<Files\\Audio Interview with Student J> - § 1 reference coded [0.21% Coverage]

Reference 1 - 0.21% Coverage

Ultimately UDI wants equality and they want inclusiveness for everyone to feel included.

Students' conversations supported that new ways proposed by the UDI must be explored by the university to remain responsive to the needs of SWVDs. As such, the implementation of UDI can improve the university's capacity to respond to a greater diversity of learning needs. Therefore, student respondents declared that students and lectures in the classroom being unaware of their visual impairment invoked feelings of exclusion. Universal Design of Instruction offers a system that exposes lecturers and other students in the classroom to a greater diversity of learner needs, encouraging the acceptance of new ways of teaching and learning, tolerance for diversity and equalization of opportunities (Subrayen 2011).

5.8.4.2 Achievement

Student respondents pointed out that more than a sense of belonging; students want to feel a sense of personal achievement. Students felt that UDI implementation can provide an opportunity to succeed in their endeavours and in turn enhance their self-esteem and instil a sense of belonging, motivation and confidence in them to find ways to improve.

<Files\Audio Interview with Student E> - § 1 reference coded [0.62% Coverage]

Reference 1 - 0.62% Coverage

Yes, it will give you a sense of belonging but more than a sense of achievement it will give you a sense of, give you a sense of how can I, it gives you a sense of what is this word, chance.

<Files\Audio Interview with Student N> - § 1 reference coded [0.61% Coverage]

Reference 1 - 0.61% Coverage

Yeah for those with these disabilities they see where they belong and they can know how to improve their studies yeah I think if the seven principles were implemented it will assist them in having the sense of belonging.

<Files\Audio Interview with Student O> - § 1 reference coded [0.69% Coverage]

Reference 1 - 0.69% Coverage

When I started to get the help, the work became much easier. So, I was now able to complete my work if I'm writing a test they give me extra time so I was able to complete the test so those changes made me feel to that I can improve myself, I can achieve what I want you know, I'm trying.

Maslow's(1943/54) hierarchical theory of human needs focuses on human potential and the ability to strive to reach the highest level of their capabilities (Mousavi & Dargahi, 2013).

Providing an all-inclusive learning environment enriched with reasonable accommodations to support learning would facilitate learning for SWVDs. For instance, students found that they could complete their work or tests as extra time allocation made them feel that it was possible to achieve. Students felt that they are making the effort and trying. Therefore, inclusive teaching and learning practices will be a welcome response and will help them believe that it is possible to improve and that they too can achieve. It can be construed that through the application of Universal design principles and practices, it becomes highly attainable for SWVDs to achieve their academic potential (McLeod, 2014).

5.8.4.3 Equity

Students indicated that they are uncomfortable in their surroundings and are constantly seeking social belonging because they have experienced the stigma of being treated as different. Students responded that they can no longer tolerate being singled out due to the lack of equitable access to education in the classroom. If learning materials were flexible to use, it would give them the freedom to choose the most appropriate means to approach their studies.

<Files\Audio Interview with Student D> - § 2 references coded [1.13% Coverage]

Reference 1 - 0.58% Coverage

Definitely. I'd feel like I belong, like I belong in that class because I'll be working , you know, make, like, I'd say I wouldn't feel different cos without it I feel as if I am different.

Reference 2 - 0.55% Coverage

So with it being implemented, I wouldn't feel different or feel that there's a need for me to be understood or to be, you know, feel as if I am normal and like, as everybody else.

<Files\Audio Interview with Student G> - § 2 references coded [0.95% Coverage]

Reference 1 - 0.13% Coverage

I would feel like I am normal like the other students.

Reference 2 - 0.82% Coverage

Because there will be no stigmatization, there will be no you know singling you out, you will know exactly where to go to when you walk into the classroom because they will have equitable use of the classroom so that everyone has equal access, and then your study materials will be flexible to use, you can choose whichever method you want to use.

Students believe that through equitable use everyone will have equal access in the classroom. A universal design system will reduce barriers to learning while maintaining high achievement standards for all, which will help SWVDs feel normal like everybody else (Burgstahler, 2015). Students insist that there must be equality for all students and believe that Universal Design of Instruction (UDI) will level the playing field so that all students can gain knowledge, skills and enthusiasm for learning equitably (Burgstahler, 2015). Maslow (1943/54) verified that SWVDs who experience educational equity and who are granted the opportunity to participate equally in the classroom will strengthen their feeling of belonging, which will result in enhanced self-esteem that will motivate students to perform.

5.8.4.4 Self Esteem

Students believe that the principles of UDI can advance how they perceived information in the classroom. Students prefer the all-inclusive classroom that UDI promises and are adamant that such a system will help them find all they need to succeed like everyone else. Sending SWVDs to the DSU for assistance did not work well for SWVDs and left them feeling singled out as a person with a disability and did not promote a sense of belonging resulting in diminished self-esteem. This was revealed in the following conversations:

<Files\Audio Interview with Student L> - § 1 reference coded [0.80% Coverage]

Reference 1 - 0.80% Coverage

Okay, I think it would advance the way we perceive information at the class and it will improve our self-esteem. To feel like we belong at the classroom, not feel like you belong at the disability unit where you will find all your stuff there, no. I will have to find it at the class like everyone else so it will go a long way towards improving self-esteem and understanding of the learning.

<Files\Audio Interview with Student M> - § 1 reference coded [0.27% Coverage]

Reference 1 - 0.27% Coverage

It will bring a lot of self-confidence in the classroom there is nothing I'll be worrying about in the classroom.

Feelings of self-worth and gaining respect and recognition from the university community will lead to higher self-esteem (Zalenski & Raspa, 2006). Furthermore, well-being and enhanced self-esteem will foster a sense of belonging and inclusivity. As such, the

implementation of UDI is necessary to merge SWVDs within a mainstream classroom, promote feelings of acceptance, belonging and recognition, thus creating a wealth of opportunities to learn, participate, and express knowledge (Rahman, 2019).

5.8.4.5 Confidence /Participation/ Awareness

Green (2000) confirmed that by satisfying self-esteem needs, SWVDs will develop self-confidence and it will encourage participation, resulting in feelings of adequacy and thus motivating students to aspire to achieve their desired goals (Maslow, 1943/54). This complies with Izzo (2012), where it was proposed that SWVDs can be strategically engaged to prevent them from falling behind. Students explained that lecturers can achieve this by asking SWVDs questions during the lecture to stimulate involvement and enhance participation. Students admitted that they felt encouraged when they were prompted to answer questions in class. It increased engagement and prevented them from falling behind:

<Files\Audio Interview with Student A> - § 1 reference coded [0.20% Coverage]

Reference 1 - 0.20% Coverage

And, also I believe that once a person is confident and has that feeling of belonging in an environment

<Files\Audio Interview with Student B> - § 1 reference coded [0.60% Coverage]

Reference 1 - 0.60% Coverage

Some lecturers try to make us feel like we are a part of the class because they, you know when a lecture is in progress, when the lecturer asks you questions, when they expect you to participate, yah it that makes things a lot more easier.

Students are confident that the implementation of UDI can help overcome many barriers to accessibility by revealing design issues that people were ignorant or unaware of before. As such, they believe that UDI can promote accessible coursework and design strategies that can enhance a sense of belonging in the classroom and enable SWVDs to acquire the quality education they deserve.

5.9 Chapter Summary

This chapter featured the analysis of the qualitative data collected and formed the bulk of the information gathered from the lived experiences of SWVDs at a mainstream university. The

primary source of information emanated from interviews with SWVDs. The data were analysed using an inductive, theoretical thematic analysis contrasted with existing literature to verify and support the results. An array of themes and sub-themes emerged and revealed the actual classroom experience through the lenses of SWVDs, promoting a shift in the perceptions of how the university operates amongst several challenges and shortcomings endured by SWVDs. The analysis of qualitative data involved an in-depth discussion of the results that enabled the exploration of several key findings. The data revealed a paradigm shift to embrace a phenomenally new approach to educational inclusivity. The Universal Design of Instruction model is accepted globally and welcomed by insightful students with visual impairments. The preceding chapter will evaluate the quantitative statistics obtained through a survey method to corroborate findings revealed in the qualitative data drawn from this chapter, with reference to the research questions and the theoretical frameworks. The plausibility of the rich qualitative data gathered is justified; its accuracy measured and tested through statistical methods applied using quantitative techniques in the following chapter. The next chapter will conclude the data analysis and present the findings drawn with relevant references to discussions and arguments made in this chapter.

Chapter Six

Quantitative Analysis and Discussion

6.1 Introduction

This chapter presents the results and discusses the findings obtained from the questionnaires in this study. The questionnaire was the primary tool used to collect data and was distributed to 204 students with visual disabilities (SWVDs). The data collected from the 21 final responses was analysed with SPSS version 27.0. The results will present the descriptive statistics in the form of graphs, cross-tabulations and other figures. Inferential techniques include the use of correlations and chi square test values, which are interpreted using the p-values. The traditional approach to reporting a result requires a statement of statistical significance. A p-value is generated from a test statistic. A significant result is indicated with " $p < 0.05$ ".

6.2 The Sample

Questionnaires were distributed via an online server through Google Forms and the web address circulated to all SWVDs, 21 of which were returned, yielding a 10% response rate.

6.3 The Research Instrument

The research instrument consisted of 91 items, with a level of measurement at a nominal or an ordinal level. The questionnaire was divided into 9 questions, which measured various themes as illustrated below:

A. Biographical data

1. What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?

2. What are the current challenges in learning for students with visual disabilities in the classroom?
3. How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?
4. What factors should UKZN consider for UDI Implementation in the classroom for SWVDs
5. Maslow's Hierarchy of Needs
6. Social Model of Disability
7. Systems Theory
8. Sen's Capability Approach

6.4 Reliability Analysis

The two most important aspects of precision are reliability and validity. Current theorist in line with previous authors such as Stiles (1993) explained reliability to be the trustworthiness of data (**consistency** of a measure or whether the results can be reproduced under the same conditions), whereas validity refers to the trustworthiness of the interpretations or conclusions (the **accuracy** of a measure or whether the results really do represent what they are supposed to measure) (Lakshmi & Mohideen, 2013). Reliability is computed by taking several measurements on the same subjects. A reliability coefficient of 0.60 or higher is considered as "acceptable" for a newly developed construct (Lakshmi & Mohideen, 2013).

Table 6.1 reflects the Cronbach's alpha score for all the items that constituted the questionnaire.

	Section	Number of Items	Cronbach's Alpha
Q1.2	7 Principles of UDI	7	0.847
Q1.4	Current Learning Experiences in The Classroom	5	0.871
Q1.5	Group Assignments and Exercises in The Classroom	3	0.611
Q2	Current Challenges in Learning for Students with Visual Disabilities	9	0.762
Q3	Implementation of UDI Facilitate/Maximise Learning Outcomes	12	0.822
Q4	Factors to be Considered for Implementation of UDI to Promote Inclusive Learning	9	0.819
Q5.1	Implementation of UDI in the Classroom	6	0.867
Q5.2	UDI can Enhance Learning Outcomes in the Classroom	4	0.424
Q6.2 - Q6.4.2	Implementation of UDI in the Classroom (2)	5	0.803

Q7.1	Application of the Principles of UDI can Foster Good Relationships	4	0.724
Q7.3	Application of UDI in the Classroom will Maximise Learning Outcome	2	0.520
Q7.4	Challenges Should be Addresses by all Stakeholder at the University	2	0.673
Q8.1	Adopting the Principles of UDI in the Classroom	4	0.780
Q8.2	Applying UDI will Result in Enhanced Academic Capabilities	4	0.633
Q8.3	Applying UDI Enhance Capabilities for SWVD	4	0.910
Overall		83	0.779

Table 6.1: Cronbach's Alpha Scores

The reliability scores for most sections exceed the recommended Cronbach's alpha value. This indicates a degree of acceptable, consistent scoring for these sections of the research. Questions 5.2 and Q7.3 have lower than acceptable values. Question 7.3 has the minimum number of statements, and Q5.2 offers various levels of interpretations. It should be noted that reliability is done on a large sample. It is performed here as a measure of rigour, and for the most part, meets the requirements.

Collectively, the overall Cronbach Alpha score was above 0.7, indicating a high degree of reliability.

6.5 Descriptive Statistics

This section provides descriptive statistics of the quantitative analysis, represented in tables and graphs. It commences with biographical information:

6.5.1 Biographical

This section describes the biographical attributes of the respondents.

6.5.1.1 Age and Gender

The age and gender distribution is presented in Table 6.2 below.

Age (years)		Gender		Total
		Male	Female	
18 - 21	Count	1	4	5
	% within Age	20.0%	80.0%	100.0%
	% within Gender	12.5%	30.8%	23.8%
	% of Total	4.8%	19.0%	23.8%
22 - 25	Count	2	4	6
	% within Age	33.3%	66.7%	100.0%
	% within Gender	25.0%	30.8%	28.6%
	% of Total	9.5%	19.0%	28.6%
26 - 30	Count	5	3	8
	% within Age	62.5%	37.5%	100.0%
	% within Gender	62.5%	23.1%	38.1%
	% of Total	23.8%	14.3%	38.1%
> 30	Count	0	2	2
	% within Age	0.0%	100.0%	100.0%
	% within Gender	0.0%	15.4%	9.5%
	% of Total	0.0%	9.5%	9.5%
Total	Count	8	13	21
	% within Age	38.1%	61.9%	100.0%
	% within Gender	100.0%	100.0%	100.0%
	% of Total	38.1%	61.9%	100.0%

Table6. 2: Sample Distribution of Age and Gender

As per Table 6.2 above, the biographical attributes of the respondents indicated 38% of males and 62% of female students with visual disabilities embarking on their studies at the university. This indicates a high number of female students with visual disabilities embarking on their studies at the university. This study seized this gap by focusing on the opinions expressed by women with visual disabilities in support of women empowerment, which complies with the Women Empowerment and Gender Equality Bill (2013) (section 9 of the Constitution of the Republic of South Africa, 1996).

6.5.1.2 Age Group Explanation

In terms of the age breakdown, the majority of respondents were between the ages of 22 to 30 years indicative of the maturity of SWVDs, ideal for the study as they have considerable experience to provide rich detailed encounters of their lives as students within the university environment.

6.5.1.3 Nature of Disability

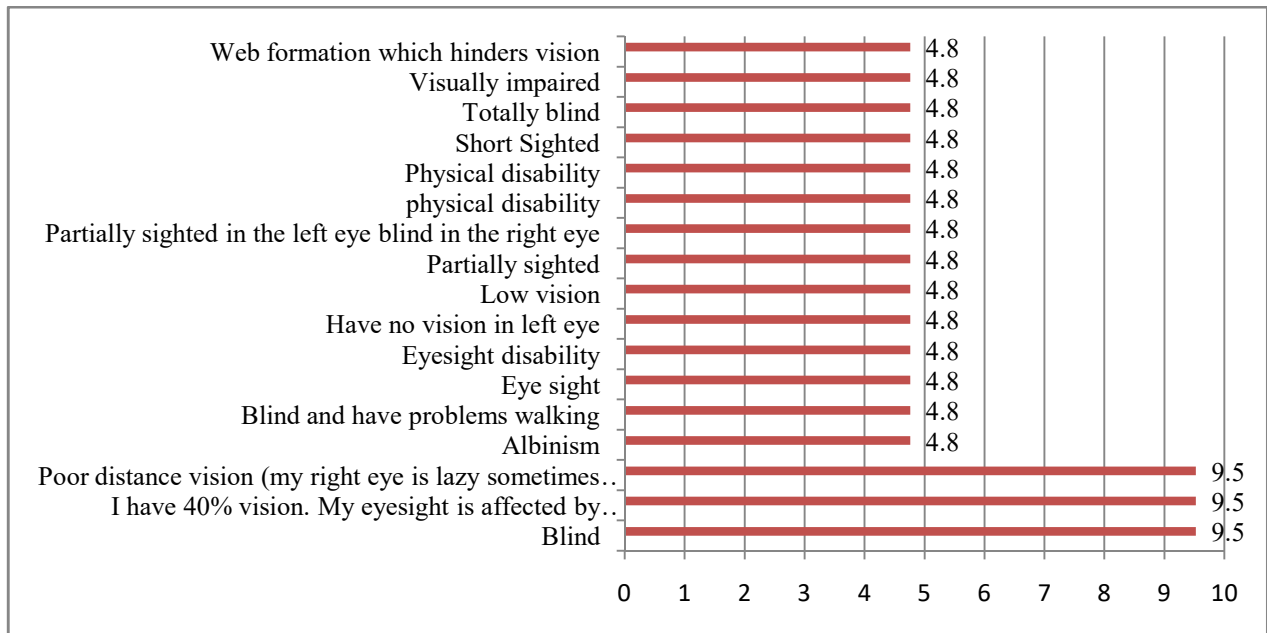


Figure 6. 1: Graphical presentation of the Nature of Disabilities at UKZN

There was almost an equal distribution of various disabilities related to visual impaired reported by all 21 students. This added value, indicating the variety of visual disabilities experienced by students. Hence these students would be able to provide a first-hand account of their experiences.

6.5.1.4 Campus and College

		Which college are you registered at?		Total
Campus		Humanities	Law and Management Studies	
Howard College	Count	7	2	9
	% within What campus are you currently based at?	77.8%	22.2%	100.0%
	% within Which college are you registered at?	41.2%	50.0%	42.9%
	% of Total	33.3%	9.5%	42.9%
Westville	Count	0	2	2

	% within What campus are you currently based at?	0.0%	100.0%	100.0%
	% within Which college are you registered at?	0.0%	50.0%	9.5%
	% of Total	0.0%	9.5%	9.5%
Pietermaritzburg	Count	2	0	2
	% within What campus are you currently based at?	100.0%	0.0%	100.0%
	% within Which college are you registered at?	11.8%	0.0%	9.5%
	% of Total	9.5%	0.0%	9.5%
Edgewood	Count	8	0	8
	% within What campus are you currently based at?	100.0%	0.0%	100.0%
	% within Which college are you registered at?	47.1%	0.0%	38.1%
	% of Total	38.1%	0.0%	38.1%
Total	Count	17	4	21
	% within What campus are you currently based at?	81.0%	19.0%	100.0%
	% within Which college are you registered at?	100.0%	100.0%	100.0%
	% of Total	81.0%	19.0%	100.0%

Table 6.3: Breakdown of SWVDs at Various Colleges within the University

The majority of students came from the College of Humanities. This is a logical finding as according to Disability Support Unit (2021), a majority of SWVDs are from the Humanities College. There was good distribution across all campuses. However, the majority were from Howard College and Edgewood, which is in accordance with statistics from the Disability Support Unit (2021). The value of this is that the responses can be seen as representative of all campuses.

6.5.1.5 Year of Study

The figure below indicates the year of study of the respondents.

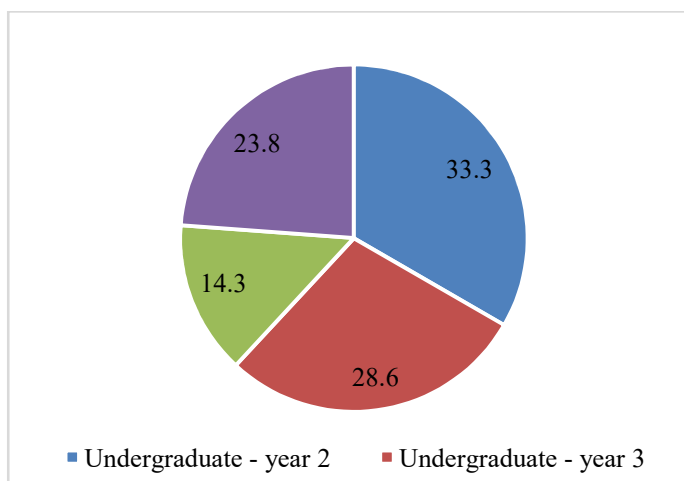


Figure 6. 2: Year of study of respondents

There was a fair distribution in terms of year of study, thereby providing a multi-pronged perspective from respondents in various levels of study.

6.5.1.6 Race

	Frequency	Percent
African	18	94.7
Indian	1	5.3
Not Stated	2	10.6
Total	21	100.0

Table 6. 4: Demographics of Participants

The racial distribution of the student respondents was primarily African, which is representative of the institutional demographics (UKZN Strategic Plan, 2021).

6.6 Section Analysis

This will provide sections for each question asked in the questionnaire and are grouped according to the respective section themes.

6.6.1 Experiences of Students with Visual Disabilities in Coping with Current Teaching Practices in the Classroom

This section deals with how SWVDs are coping with current challenges in the learning environment.

6.6.1.1 Familiarity with UDI

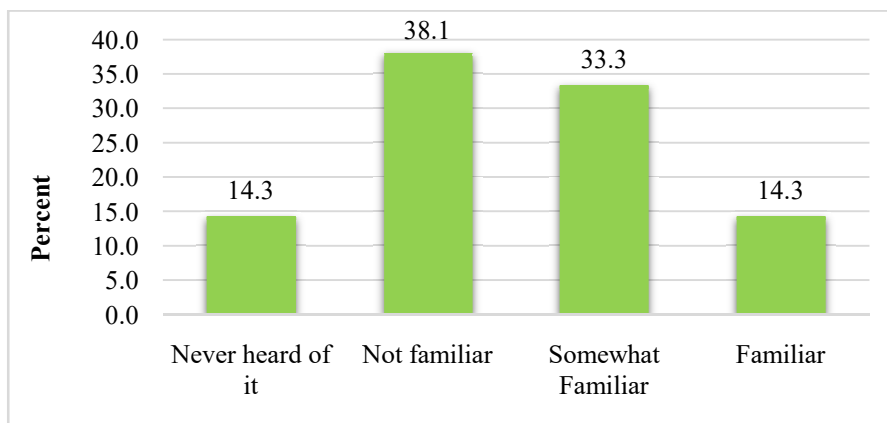


Figure 6. 3: Indication of Familiarity of SWVDs with UDI

Statistics in the graphical representation above indicate that the majority were not familiar with UDI, indicating a lack of the application of such principles in the classroom. Therefore, Izzo(2012) suggested that researchers further develop and validate universal design principles and strategies to enhance inclusivity.

6.6.1.2 The Rate of UKZN's Compliance with the Principles of UDI in their Classroom Environment

On a scale of 1- 10 where 1 is very poor/non-compliance and 10 is extremely compliant), respondents were asked to rate UKZN's compliance with the principles of UDI in their classroom environment.

	Scale	Frequency	Percent
Valid	1	1	4.8
	2	1	4.8
	3	5	23.8
	4	2	9.5
	5	4	19.0
	6	1	4.8
	7	4	19.0
	8	1	4.8
	9	2	9.5
	Total	21	100.0

Table 6. 5: Rating of UKZN’s Compliance with UDI

Statistics indicate that 13 of the 21 respondents gave a ranking of 5 and below for UDI compliance in the classroom. This indicates a lack of UDI compliance, which Black et al.(2014) attributed to insufficient knowledge and understanding of how to provide appropriate accommodations, curriculum, class materials and choices for SWVDs. Black et al.(2014) attested that UDI provided a variety of instructional methods and learning techniques in addition to traditional lectures to create a more inclusive environment for SWVDs in the classroom. Therefore, UDI compliance was needed at UKZN.

6.6.1.3 The Rate at which the 7 Principles of UDI are being met in the Classroom

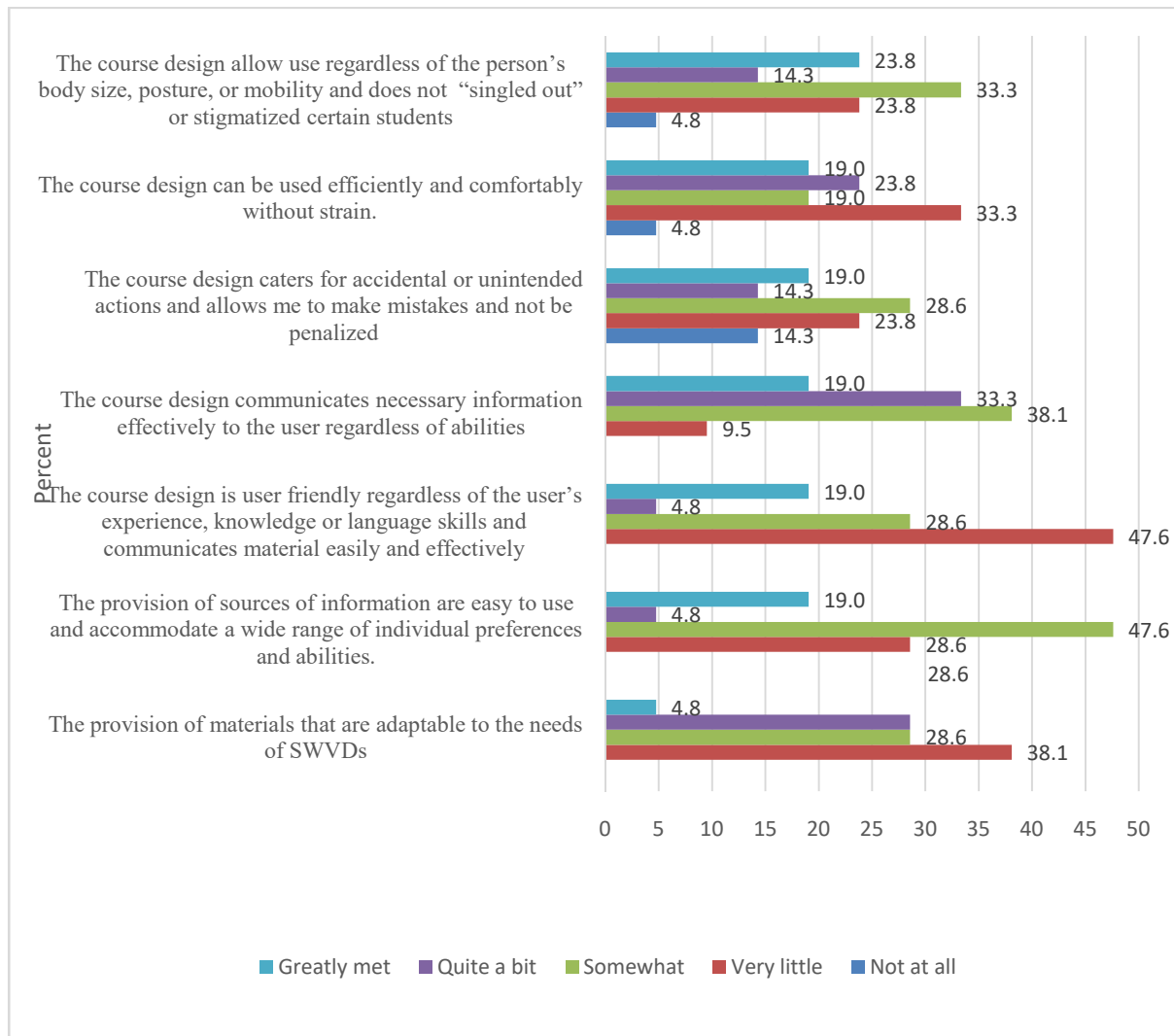


Figure 6. 4: The rate at which the 7 principles of UDI are being met in the classroom

Holistically, students indicated that the 7 principles are not being met in the classroom at the university. This is evident from the graph showing that a majority indicated somewhat to very little compliance for all principles. Hence one can deduce that:

- The provision of materials are not adaptable to the needs of SWVDs. (67% agreement);
- The provision of sources of information is not easy to use and does not accommodate a wide range of individual preferences and abilities (76% agreement);
- The course design is not user-friendly, regardless of the user's experience, knowledge or language skills and communicates material easily and effectively (76% agreement);

- The course design does not communicate necessary information effectively to the user regardless of abilities (48%agreement);
- The course design does not caters for accidental or unintended actions and allows one to make mistakes and not be penalized (67%agreement);
- The course design cannot be used efficiently and comfortably without strain (57%agreement); and
- The course design does not allow use, regardless of the person’s body size, posture, or mobility and does not “single out” or stigmatize certain students(62% agreement).

This collectively indicates the poor applicability of UDI principles in the classroom for SWVDs, thereby creating a challenging learning environment. Dutta (2013) and Rahman(2019) affirmed that visually impaired people have the same range of intellectual ability as other students and argued that the problem arises when there is limited adherence to UDI principles to promote learning for SWVDs. This creates additional barriers, hindering the attempts of SWVDs to be on par with their sighted peers and acquire equal education (Dutta, 2013).

6.6.1.4 Current Learning Experiences in the Classroom

Results indicate that the current learning experiences of SWVDs were fraught with difficulties.

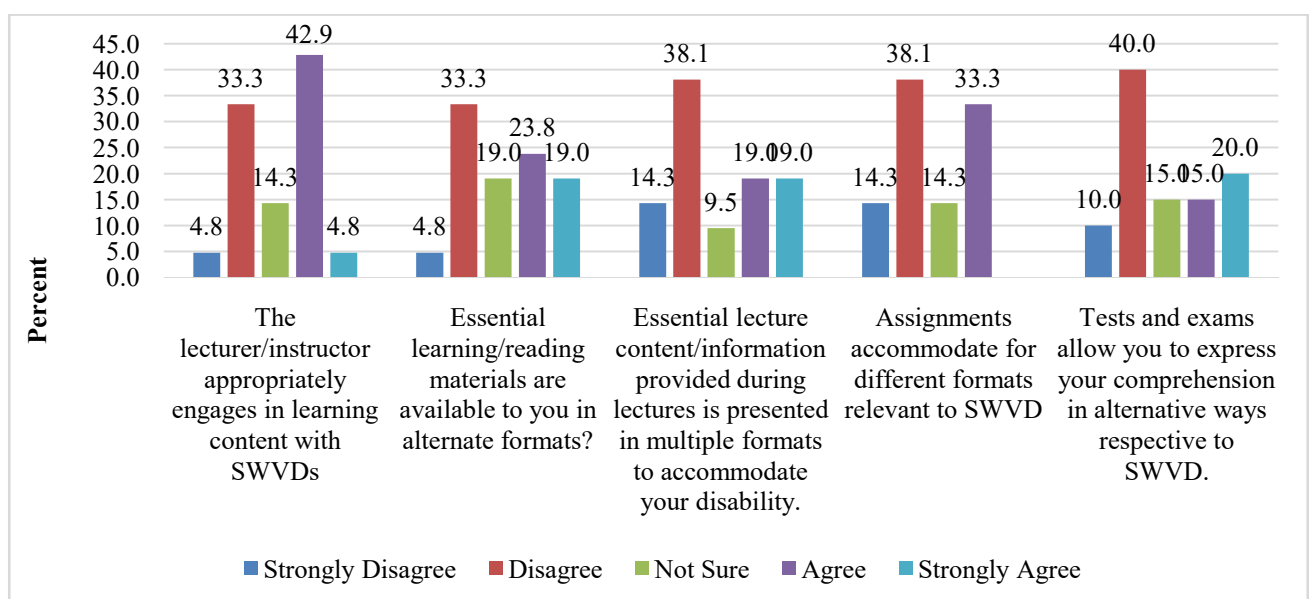


Figure 6. 5: Current Learning Experiences in the Classroom

There was almost equal agreement and disagreement that the lecturer/instructor appropriately engages in learning content with SWVDs. However, almost 60% of respondents disagreed and were uncertain that essential learning/reading materials were available to them in alternate formats. In addition, almost 63% disagreed and were uncertain that essential lecture content/information during lectures was presented in multiple formats to accommodate their disability. Only 33.3% agreed that assignments accommodate for different formats relevant to SWVD, whilst 66.6% disagreed. Similarly, 35% of students agreed that tests and exams allow them to express than comprehension in alternative ways respective to SWVD, whilst 65% were uncertain and disagreed.

These results therefore confirm that the current learning experience of students in the classroom was hindered due to a lack of UDI. It was argued in Munene (2017) and Dutta (2013) that UDI implementation was appropriate as it was derived from basic teaching strategies where simple adjustments to formats can improve on time constraints and access to course content. The outcome of UDI implementation is intended to increase the opportunity for diverse learners to fully participate in the learning environment (Munene, 2017). Therefore, the university requires a universal design system that ensures that learning and instruction are inclusive and presented in flexible formats in every classroom to increase the epistemological access and independence of all students.

6.6.1.5 Group Work

Although learning happens in the classroom between the lecturer and the student, learning also happens between students in the classroom.

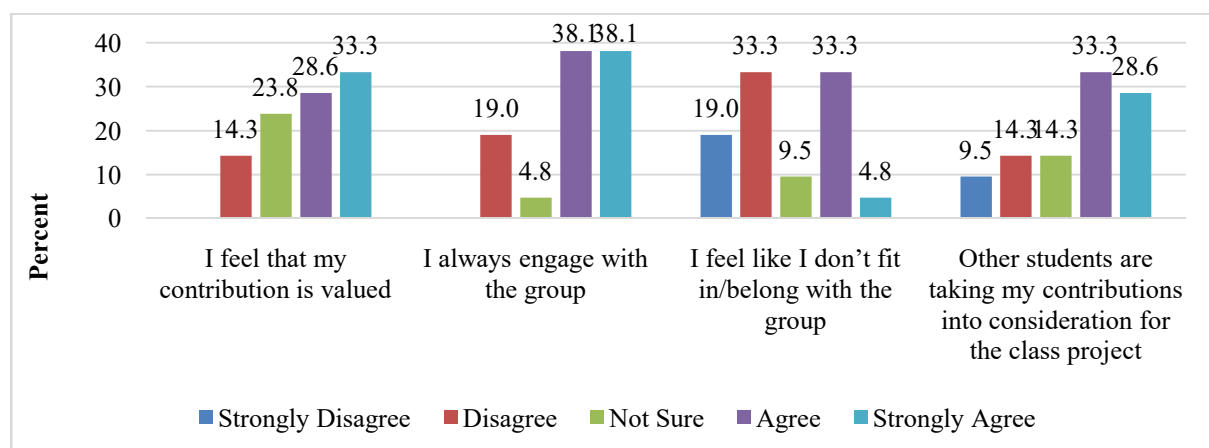


Figure 6. 6: The Experiences of SWVDs and Group Work

When working on group assignments and exercises in the classroom, the majority felt that their work was valued. Almost 80% of respondents made efforts to engage with the group. However, almost 60% of respondent did not feel a sense of belonging to the group and over 60% felt that other students were taking their contributions into their projects. Although working in groups can increase feelings of belonging amongst SWVDs, it also provides opportunities to work with and become familiar with other students (Bensen & Dundis, 2003). However, due to the use of assistive devices and other adaptations to fonts, SWVDs find it difficult to interact and participate in group activities. The university needs to be cognisant of the fact that a participatory approach provided SWVDs with opportunities to participate in new and different groups, expanding their sense of belonging (Maslow, 1943/54)

6.6.2 Current Challenges in Learning for Students with Visual Disabilities in the Classroom

The section describes the current challenges experienced by SWVDs in the classroom.

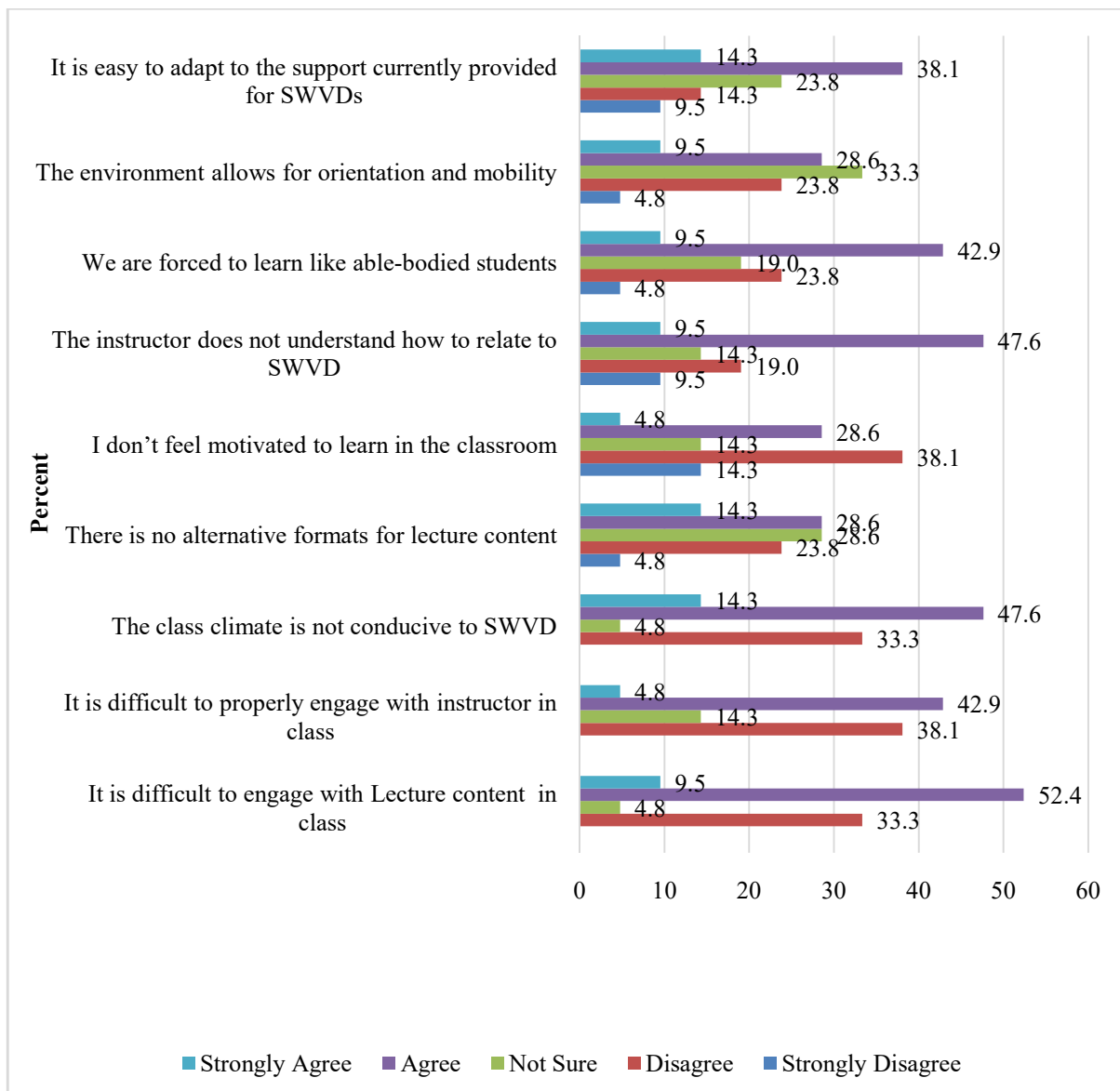


Figure 6. 7: Current Challenges Experienced By SWVDs in the Classroom

It is apparent from the graph that the majority of SWVDs are experiencing difficulty in engaging with the lecturers who do not understand and have problems adapting to the course content and current supports provided (60%). Although SWVDs agree that some level of support allows for accessibility, the majority believe that they are forced to learn like able-bodied students (70%), lack motivation and find it difficult to engage with the lecture content due to a classroom climate that is not conducive to SWVDs (Subbiah, 2020 and Subrayen & Suknunan, 2019).

6.6.3 Implementation of UDI to Facilitate/Maximise Learning Outcomes for Students with Visual Disabilities in the Classroom

This section looks at whether the implementation of UDI will facilitate/maximise learning outcomes for students with visual disabilities in the classroom.

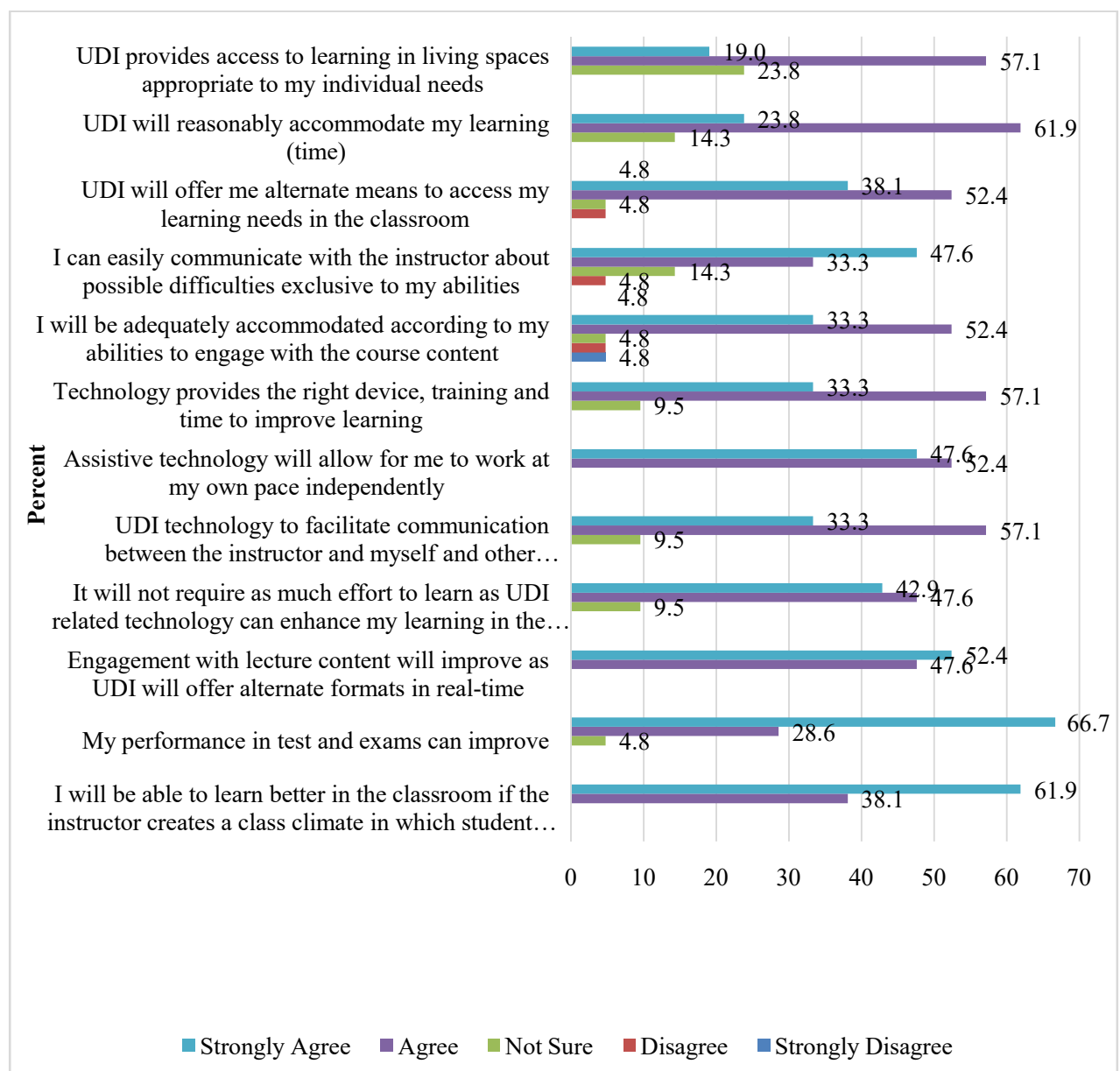


Figure 6. 8: UDI Implementation and Learning Outcomes

A majority of the respondents agreed and strongly agreed that the implementation of UDI will facilitate/maximise learning outcomes for students with visual disabilities in the classroom. This is evident in Figure 6.8 above, whereby:

- I will be able to learn better in the classroom if the instructor creates a class climate in which student diversity is respected (100% agreement);
- My performance in tests and exams can improve (95% agreement);
- Engagement with lecture content will improve as UDI will offer alternate formats in real-time (100% agreement);
- It will not require as much effort to learn as UDI-related technology can enhance my learning in the classroom (90% agreement);
- UDI technology facilitate communication between the instructor and myself and other students (90% agreement);
- Assistive technology will allow for me to work at my own pace independently (100% agreement);
- Technology provides the right device, training and time to improve learning (90% agreement);
- I will be adequately accommodated according to my abilities to engage with the course content (90% agreement);
- I can easily communicate with the instructor about possible difficulties exclusive to my abilities(75% agreement);
- UDI will offer me alternate means to access my learning needs in the classroom (90% agreement);
- UDI will reasonably accommodate my learning (time) (85% agreement); and
- UDI provides access to learning in living spaces appropriate to my individual needs (76% agreement).

Hence, overall, one can clearly see that it is more than evident that the implementation of UDI can definitely maximise learning outcomes for students with visual disabilities in the classroom. The Universal Design of Instruction is therefore an appropriate strategy to be applied at the university to ensure that teaching styles, instructional materials and educational goals are designed and modified to fit the student's specific learning needs and enhance their visual learning experience (Salleh&Zainal, 2010). Rahman (2019) added that UDI allows for the integration of a variety of strategies, creating a wealth of opportunities to learn, participate and express knowledge.

6.6.4 Factors to Be Considered for the Implementation of UDI to Promote Inclusive Learning for Students with Visual Disabilities in the Classroom

This section establishes the factors necessary for the implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom.

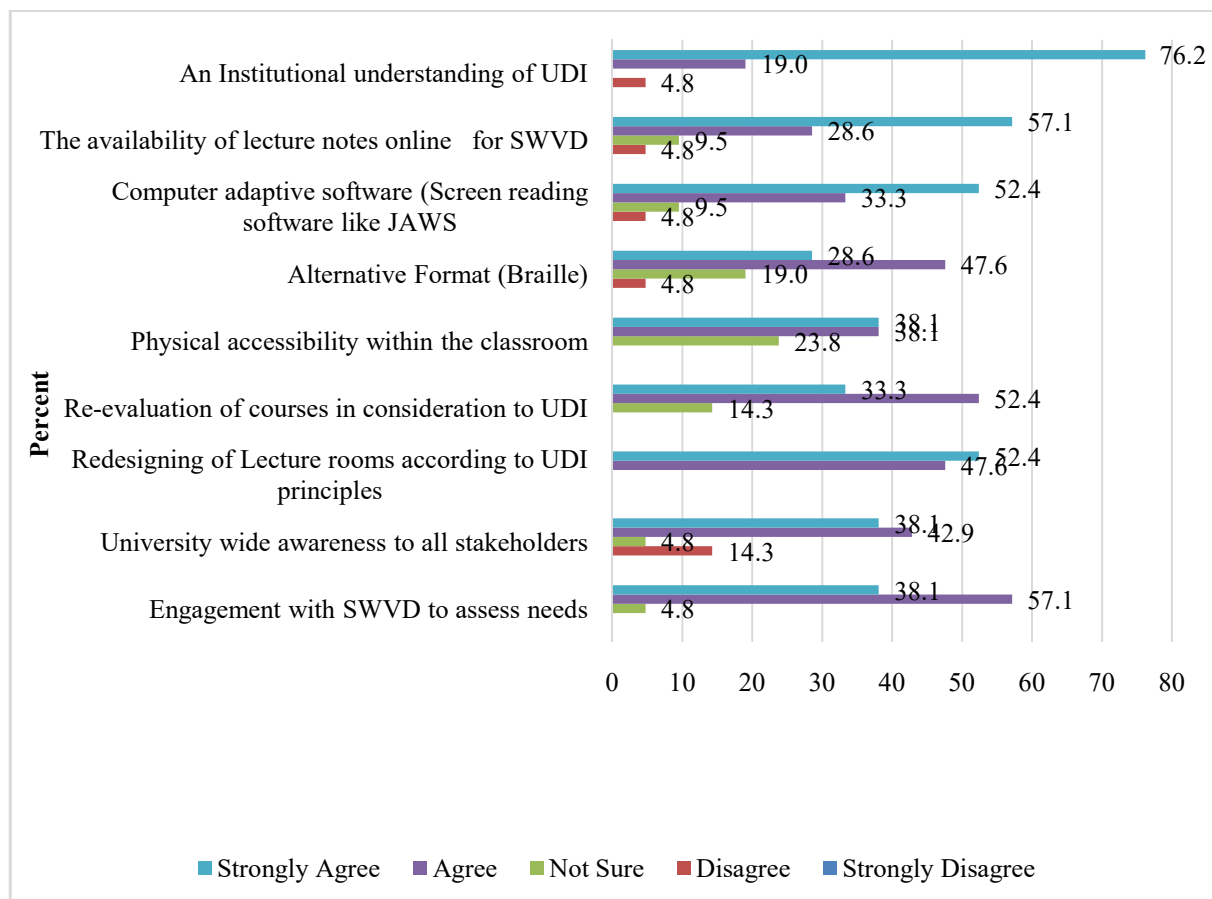


Figure 6. 9: Factors that must be considered for the implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom

There is a general agreement from respondents that consideration be given to the listed factors above for the implementation of UDI at the university. Student respondents agreed or strongly agreed about various crucial factors that advocate the implementation of UDI at the university:

- Engagement with SWVD to assess needs (95%)
- Over 80% required University-wide awareness for all stakeholders
- Re-designing of Lecture rooms according to UDI principles (100%)
- Re-evaluation of courses in consideration of UDI (86%)

- Physical accessibility within the classroom (76%)
- Alternative Formats (Braille) (76%)
- Computer adaptive software (Screen reading software like JAWS (86%)
- The availability of lecture notes online for SWVDs (86%)
- Up to 95% believed that the university did not understand the implication of implementing UDI.

This section highlighted factors that promote the implementation of UDI for inclusive learning for SWVDs in the classroom. It is apparent from the responses that the majority agree that the listed factors for the implementation of UDI be taken into consideration in designing curriculum, teaching and learning environments. Hewett et al. (2018) expressed that the university needed to transform the entrenched attitudes of traditional HE systems and evolve by embracing a new educational perspective such as UDI, which required a period of learning and knowledge acquisition by all stakeholders.

6.6.5 Application of Models for the Incorporation of UDI to Promote Learning Outcomes for Students with Visual Disabilities

This section evaluated the applicability of the Models used to conceptualise the incorporation of UDI to promote learning outcomes for students with visual disabilities.

6.6.5.1 Maslow's Hierarchy of Needs

This section deals with the applicability of Maslow's Hierarchy of Needs model to conceptualise the incorporation of UDI to promote learning outcomes for SWVDs.

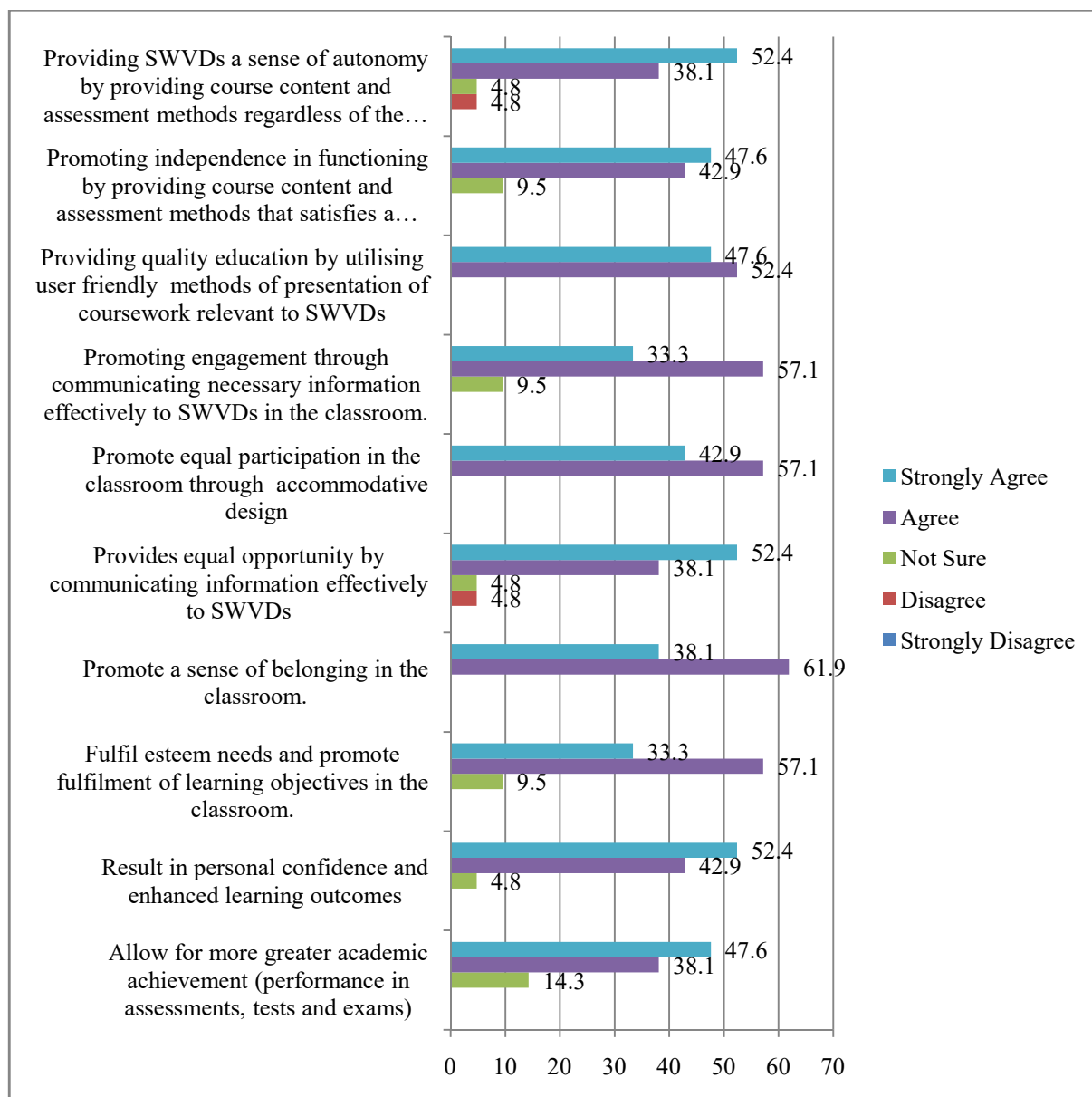


Figure 6. 10: Applicable constructs of Maslow's Hierarchy of Needs Model

The majority are in agreement that the implementation of UDI in the classroom can promote equal participation in class (100%); provide equal opportunities for communicating information effectively for SWVDs (90%); promote a sense of belonging (100%); promote esteem needs and fulfilment of learning (90%); promote personal confidence levels (95%) and allow for greater academic achievement (85%). It can clearly be found that UDI implementation does support Maslow's (1943/54) Hierarchy of Needs Model. Fallatah and Syed (2017) stated that satisfying esteem needs, the need for the recognition of one's autonomy and independence showed respect for one's rights, appreciation for one's ability and acknowledged one's achievement. By introducing a universal model of inclusive practice

such as UDI, the university can help SWVDs feel self-confident, worthy and capable individuals who are useful and necessary in the world (Marimuthu & Cheong, 2015).

6.6.5.2 Social Model of Disability

This section evaluates the Social model of Disability for its applicability regarding UDI implementation.

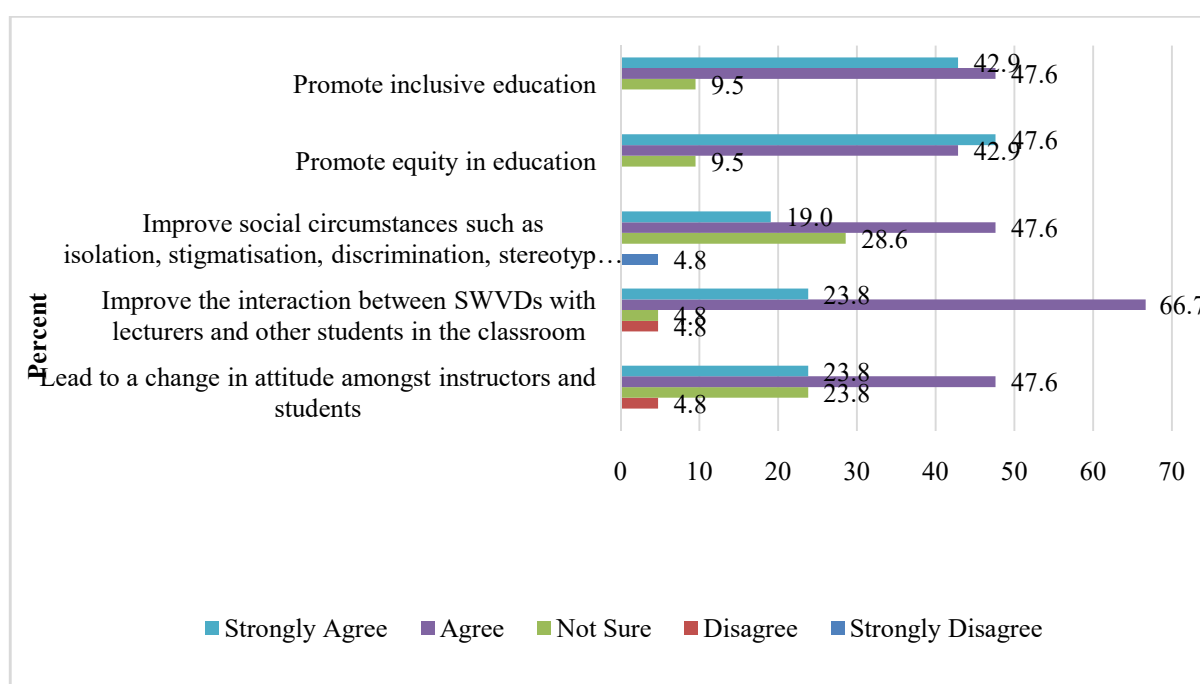


Figure 6. 11: Applicable constructs of the Social Model of Disability

Students with visual disabilities are in agreement that UDI implementation can promote equity and inclusive education (90%). Over 60% percent agreed that it can improve social circumstances such as isolation, stigmatisation, discrimination, stereotyping and myths about disability in the classroom. Kasiram and Subrayen (2013) established that exclusion was a deliberate incarceration that resulted from the social attitudes of the dominant group, and recommended the adoption of the Social Model of disability to address social transformation for the inclusion of persons with visual disabilities. The majority are in support of UDI implementation as it can influence a change in attitude amongst instructors and students (70%), thereby improving the interaction between SWVDs with lecturers and other students in the classroom (90%). The statistical information contained in the graph demonstrated the applicability of the Social Model in UDI implementation.

6.6.5.3 Systems Theory

This section looks at the applicability of Systems Theory for UDI implementation.

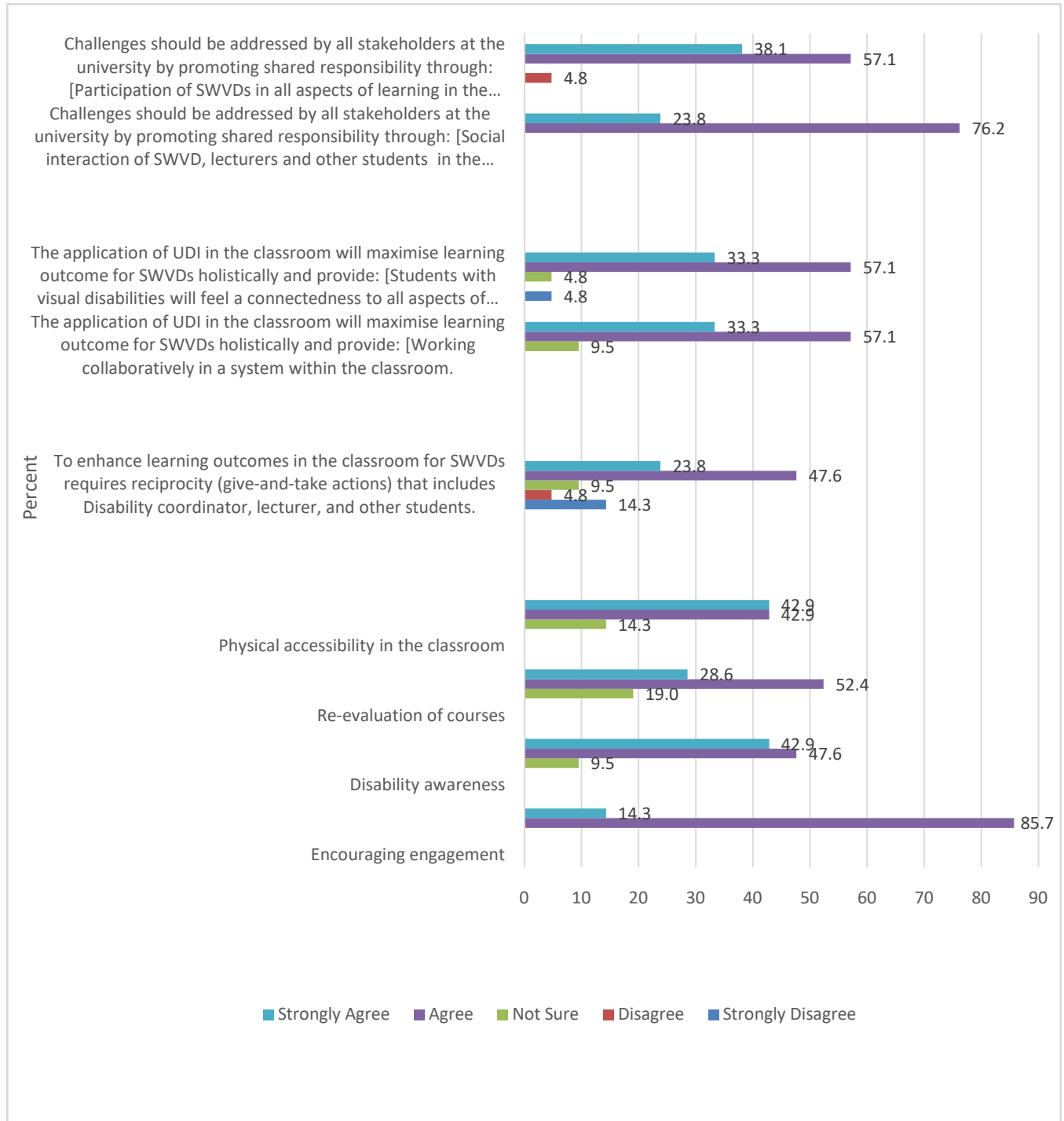


Figure 6. 12: Applicable constructs of Systems Theory

The statements all show significantly higher levels of agreement. A general overview of the graph suggests a mutual agreement for the applicability of Systems Theory for the implementation of UDI. The Universal Design of Instruction in the classroom will encourage engagement (100%), promote disability awareness (90%), encourage re-evaluation of courses (90%) and allow physical accessibility in the classroom (85%). Furthermore, over 70% agreed and strongly agreed that UDI will enhance learning outcomes in the classroom for SWVDs through reciprocity (give-and-take actions), including the Disability coordinator, lecturer and other students. The application of UDI in the classroom will maximise learning outcome for SWVDs holistically (94%) and enable all stakeholders to work collaboratively (94%) in a system within the classroom. The implementation of UDI will promote shared responsibility through: Social interaction of SWVD, lecturers and other students (100%) and participation of SWVDs in all aspects of learning in the classroom (99%). Systems Theory aligns with the Social Model in promoting a paradigm shift that focuses on relationships between individuals and their environment and directs attention away from individuals and problems viewed in isolation (Becvar & Becvar 2014). Therefore, Storrie et al. (2010) highlighted that Systems Theory promoted a holistic philosophy of inclusion that required a comprehensive outlook of the entire system.

6.6.5.4 Sen's Capability Approach

This section describes the applicability of SEN's Capability Approach.

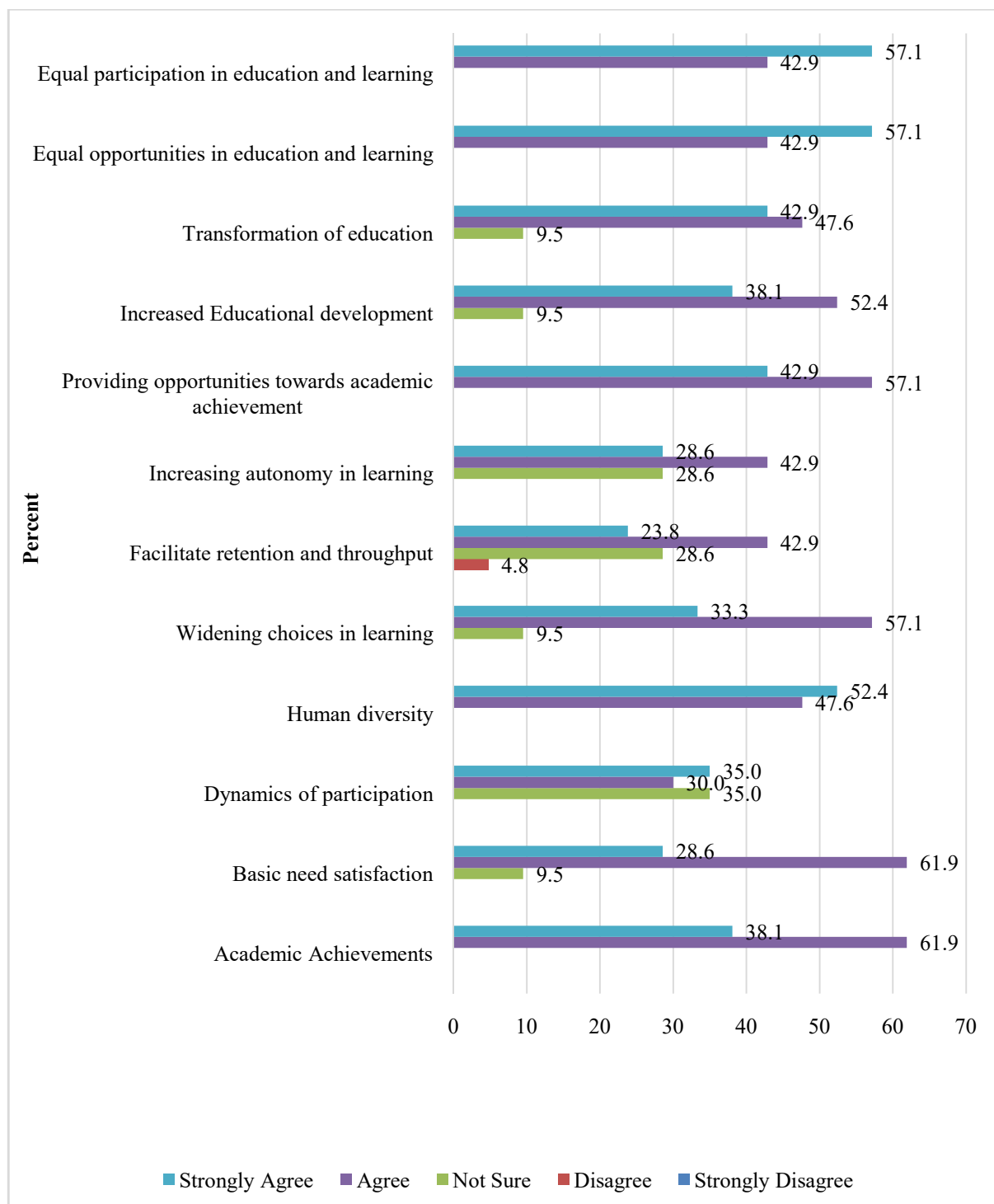


Figure 6. 13: Applicable constructs of Sen's Capability Approach

Sen's Capability Approach provides favourable grounds for the implementation of UDI showing significantly higher levels of agreement graphically (Figure 6.13). Based on the statistical outcome, Sen's Capability Approach is a highly applicable model for the implementation of UDI to maximise learning outcome in the classroom as it focuses on:

- Academic Achievements (100%)
- Basic need satisfaction (90%)
- Dynamics of participation (65%)
- Human diversity (100%)
- Widening choices in learning (90%)
- Facilitate retention and throughput (67%)
- Increasing autonomy in learning (71%)
- Providing opportunities towards academic achievement (100%)
- Increased Educational development (90%)
- Transformation of education (90%)
- Equal opportunities in education and learning (100%)
- Equal participation in education and learning (100%)

The Capability Approach focuses on ensuring equality and developing human potential, which aligned with the principles of UDI to enhance the capabilities of SWVDs, thereby reducing the consequences of disability and increasing opportunities for SWVDs to satisfy their basic need for quality education (Broderick, 2018; Dubois and Trani, 2009).

6.7 Chi Square-Cross Tabulations

A Chi square test of independence was performed to determine whether there was a statistically significant relationship between the variables (rows vs. columns).

The null hypothesis states that there is no association between the two. The alternate hypothesis indicates that there is an association. McHugh (2013) explained that the Chi-square test provides information on the significance of any observed differences. Furthermore, it provides detailed information on categories with any observable differences whilst testing whether the data is as expected (McHugh, 2013). This provides an opportunity to investigate the relationships between the challenges of SWVDs and the accessibility of the mainstream university environment.

The table summarise the results of the chi square tests. Some of the logical and direct/significant relationships are presented below.

6.7.1 Direct/Significant Relationships of Chi-Square Test of Independence

6.7.1.1 Current Year of Study and Adaptability of Course Design

- a) The provision of materials that are adaptable to the needs of SWVDs * What is your current year of study?

Chi-Square Tests						
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	20.583 ^a	9	0.015	0.005		
Likelihood Ratio	21.214	9	0.012	0.013		
Fisher-Freeman-Halton Exact Test	15.530			0.014		
Linear-by-Linear Association	4.127 ^b	1	0.042	0.046	0.021	0.006
N of Valid Cases	21					

Table 6. 6: The provision of materials that are adaptable to the needs of SWVDs vs. what is your current year of study?

All p-values more than 0.05 do not have a significant relationship. For example: The p-value between “The provision of materials that are adaptable to the needs of SWVDs” and “What your current year of study is?” is 0.014. This means that there is a significant relationship between the above two variables. That is, the year of study of the respondent did play a significant role in terms of how respondents viewed the adaptability of materials.

It is noted that all of the postgraduate respondents indicated that very little materials were adaptable. More than half of the undergraduate year-2 indicated “Somewhat”, whilst the undergraduate year-4 indicated that this was met often. The graphical representation (Figure 6.5 Section 6.6.1.4) confirmed that a majority of SWVDs disagreed that essential learning/reading materials were available to them in alternate formats. Furthermore, many disagreed that essential lecture content/information during lectures was presented in multiple formats to accommodate their disability. Temesgen (2018) contended that the poor provision of adapted material is a major challenge for SWVDs, which can impact on retention and dropout rates at various levels/years of study. As such, Rahman (2019) advised that UDI can be applied for the successful inclusion of SWVDs as it provided a range of equipment,

facilities, educational arrangements and provision of services to meet the needs of SWVDs at all levels/years of study.

b) Improve the interaction of SWVDs with lecturers and other students in the classroom * What is your current year of study?

Chi-Square Tests						
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	14.274 ^a	9	0.113	0.069		
Likelihood Ratio	13.953	9	0.124	0.082		
Fisher-Freeman-Halton Exact Test	11.737			0.099		
Linear-by-Linear Association	2.353 ^b	1	0.125	0.150	0.063	0.022
N of Valid Cases	21					

Table 6. 7: Improve the interaction of SWVDs with lecturers and other students in the classroom vs. what is your current year of study?

Similarly, the relationship between “Improve the interaction between SWVDs with lecturers and other students in the classroom” and “What is your current year of study?” reflected a P value less than 0.05, indicating a significant relationship (p-value of 0.099). This implied that as SWVDs progress through their years of study, they weremore likely to improve interactions with lecturers and other students as mutual meetings exposed other students to SWVDs and encouraged sharing, which ultimately sensitised sighted students towards disability favouring inclusive attitudes and practice (Juklová & Ulrichová, 2011 and Vickerman & Blundell, 2010). The statistical information contained in the graph (Figure 6.11) section 6.6.5.2 demonstrated that a majority SWVDs are in support of UDI implementation as it can influence changes in attitude amongst instructors and students, thereby improving the interaction between SWVDs with lecturers and other students in the classroom.

- c) **Improve social circumstances such as isolation, stigmatisation, discrimination, stereotyping and myths about disability in the classroom. * What is your current year of study?**

Chi-Square Tests						
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	16.917 ^a	9	0.050	0.029		
Likelihood Ratio	20.799	9	0.014	0.014		
Fisher-Freeman-Halton Exact Test	15.502			0.014		
Linear-by-Linear Association	.487 ^b	1	0.485	0.528	0.278	0.042
N of Valid Cases	21					

Table 6. 8: Improve social circumstances such as isolation, stigmatisation, discrimination, stereotyping and myths about disability in the classroom vs. what is your current year of study?

The current year of study also revealed a significant relationship in improving social circumstances such as isolation, stigmatisation, discrimination, stereotyping and myths about disability in the classroom, showing a p-value of 0.014. The graphical representation Figure 6.11, section 6.6.5.2 illustrated that many SWVDs agreed that it can improve such social circumstances about disability in the classroom. Juklová and Ulrichová (2011) and Louari (2013) suggested that personal contact with SWVDs enabled other students to understand their challenges. This indicated that exposure through a higher level of study and greater exposure to mainstream students provide the necessary shared experience to help develop an understanding about biases and misconceptions held by other students in relation to SWVDs.

6.7.1.2 College of Study and Course Design

- a) **There is no alternative formats for lecture content * which college are you registered at?**

There was a significant relationship of 0.041 between College and the course design is user friendly, regardless of the user's experience, knowledge or language skills and communicates material easily and effectively. This shows that the college where the student was registered plays a role in course design applicability to SWVDs.

Chi-Square Tests							
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability	
Pearson Chi-Square	8.894 ^a	4	0.064	0.041			
Likelihood Ratio	9.901	4	0.042	0.041			
Fisher-Freeman-Halton Exact Test	7.471			0.041			
Linear-by-Linear Association	2.086 ^b	1	0.149	0.227	0.119	0.074	
N of Valid Cases	21						

Table 6. 9: There is no alternative format for lecture content vs. which college are you registered at?

Frequency statistics indicate that most students (81%) were from the College of Humanities and this College does have the highest number of SWVDs enrolled (refer to Table 6.3, section 6.5.1.4). Hence the College was more accustomed to SWVDs and their needs in terms of course design. The College of Humanities had themajority of SWVDs enrolled where (70 %)disclosed that no alternative formats for lecture content were provided (Refer to section 6.6.2 and Figure 6.7). This verified that although the university hadmade efforts toprovide accommodations, many barriers remain. Gallego and Busch(2015) attributed the current situation to a lack of understanding about accommodations and differences in perceptions leading to the inconsistent application of accommodations,which had a negative influence ontheperformance and retention of SWVDs.

b) Re-evaluation of courses in consideration of UDI * Which college are you registered at?

Chi-Square Tests						
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.412 ^a	2	0.025	0.019		
Likelihood Ratio	8.255	2	0.016	0.019		
Fisher-Freeman-Halton Exact Test	6.773			0.019		
Linear-by-Linear Association	.388 ^b	1	0.533	0.691	0.411	0.259
N of Valid Cases	21					

Table 6. 10: Re-evaluation of courses in consideration of UDI vs. Which college are you registered at?

Similarly significant relationships were found between “Re-evaluation of courses in consideration to UDI” and “Which college are you registered at?” as it indicated a p-value of 0.019. This was found to be the case largely due to the majority enrolment of SWVDs at the College of Humanities (refer to Table 6.3, section 6.5.1.4), therefore requiring a greater consideration that the College of Humanities courses be re-evaluated to align with UDI. The graphical representation (Figure 6.4) in section 6.6.1.3 indicated that the majority acknowledged that the 7 principles were not being met in the classroom at the university. Blacket al. (2014) agreed that there be a constant re-evaluation of courses in consideration of the principles of UDI in current teaching methods and attitudes toward SWVDs in the classroom.

c) The availability of lecture notes online for SWVD * Which college are you registered at?

Chi-Square Tests						
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	10.191 ^a	3	0.017	0.022		
Likelihood Ratio	9.637	3	0.022	0.027		
Fisher-Freeman-Halton Exact Test	7.184			0.034		
Linear-by-Linear Association	.959 ^b	1	0.327	0.331	0.249	0.140
N of Valid Cases	21					

Table 6. 11: The availability of lecture notes online for SWVD vs. Which college are you registered at?

A noteworthy relationship was identified between “the availability of lecture notes online for SWVD” and “Which college are you registered at?” as it revealed a p-value of 0.034, indicating that SWVDs were more likely to receive notes online at the College of Humanities where there is a high concentration of registered SWVDs. It is apparent from Figure 6.9 section 6.6.4 that the majority (86%) were in favour that an important factor for the implementation of UDI at the university was to have lecture notes available online. Clearly, SWVDs understand that the application of a UDI model can provide numerous opportunities, including online and digital platforms which can enhance interaction and engagement with the content thereby maximizing learning outcomes (Izzo, 2012). This is evident in Figure 6.8 section 6.6.3 where (90%) agreed that technology provides the right device, training and time to improve learning.

d) Academic Achievements * Which college are you registered at?

Chi-Square Tests						
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	8.029 ^a	1	0.005	0.012	0.012	
Continuity Correction ^b	5.114	1	0.024			
Likelihood Ratio	9.360	1	0.002	0.012	0.012	
Fisher's Exact Test				0.012	0.012	
Linear-by-Linear Association	7.647 ^c	1	0.006	0.012	0.012	0.012
N of Valid Cases	21					

Table 6. 12: Academic Achievements vs. Which college are you registered at?

Currently, the College of Humanities is where a majority of SWVDs are registered, which is highly significant in relation to how well they performed academically, indicated by statistics with a significant value of $p = 0.012$. The university therefore needs to re-evaluate the course designs and degree programmes available on all colleges to ensure that SWVDs have a wider variety of qualifications to choose from. Broderick (2018) emphasised that how well SWVDs can function is ultimately dependent on the given opportunities which they are free to choose from. Provided that they are well equipped with appropriate accommodations, they will perform better. As such, the incorporation of a UDI across all campuses will ensure that

SWVDs are sporadically distributed throughout all colleges at the university based on their career choices.

6.8 Correlations

A Bivariate correlation was also performed on the (ordinal) data. Positive values indicate a directly proportional relationship between the variables and a negative value indicates an inverse relationship. All significant relationships are indicated by a * (showing that the correlation is not at the 0.05 level, 2-tailed) or ** (showing that the correlation is significant at the 0.01 level, 2-tailed).

The correlations were derived from the questionnaire, which was formulated around the research questions and objectives of the study. Some correlations incorporated constructs of the applied models of the study. The applied models and their related constructs are detailed in the frameworks in Chapter 3 (Table 3.1).

The correlation variables are tabulated below. The construct/s of the framework applicable to that variable is also listed.

6.8.1 Principles of UDI and Current Learning Experiences in the Classroom Revealed a Positive Correlation

Variables	Constructs of the frameworks	Correlations Coefficient
7 principle of UDI	UDI	(0.571**, p<0.05)
Current Learning Experiences in the Classroom	Social Model - Reconceptualising the experience of impairment	

Table 6. 13: The learning experiences of SWVD vs. the application of the 7 principles of UDI

This reflects a strong positive correlation between the learning experiences of SWVDs and the application of the seven principles of UDI, indicating that the more the seven principles

are adhered to, the better the learning experiences in the classroom. The graph in section 6.6.4.2 indicated that the current learning experiences of SWVDs were fraught with difficulties. In addition, Table 6.5 in section 6.6.1.2 revealed that over 60% of SWVDs indicated a lack of UDI compliance. It was also revealed in section 6.6.3. (Figure 6.8) how UDI implementation will facilitate/maximise learning outcomes for SWVDs. Baheta and Rabenstein (2018) explained that UDI principles provided multiple modes of learning to support students with and without disabilities in their learning experiences. This is evident in that several universities such as the University of Minnesota, University of Washington and the University of Connecticut (Burgstahler, 2018; Harbour & Madaus, 2011) have applied UDI, providing curriculum designs and institutional environments that are fully adapted to accommodate the greatest diversity of students.

6.8.2 UKZN's Compliance with the Principles of UDI and Current Learning Experiences in the Classroom

Variables	Constructs of the frameworks	Correlations Coefficient
UKZN's compliance with the principles of UDI	UDI Principles	(0.447*, p<0.05)
Current Learning Experiences in Classroom		

Table 6. 14: UDI Compliance vs. learning experiences in the classroom

There is a positive correlation between UKZN's compliance with the principles of UDI and current learning experiences in the classroom. This implies that the more UKZN complies with the principles of UDI, the better the learning experiences of SWVDs can be. The rate of UKZN's compliance revealed a lack of compliance with the principles of UDI in the classroom environment (see 6.6.1.2 above). With a growing number of SWVDs annually, UKZN remains non-compliant, thus limiting equal access to education dissemination. Black et al.(2014) claimed that non-compliance with the UDI principles was attributed to a lack of knowledge of how to properly include SWVDs through an understanding of how to provide appropriate accommodations, curriculum, class materials and choices in instruction that

create barriers to their education. To avoid the inequitable epistemological access to education UKZN needs to explore the potential of becoming compliant. The positive correlation revealed that UDI compliance will allow for flexibility in instruction, overcoming barriers and improving learning experiences in the classroom for SWVDs. Salleh and Zainal (2010) affirmed that it will aid in improving SWVDs' visual learning experience and assist them to adapt to the different situations they may face at university.

6.8.3 Factors to be considered for the Implementation of UDI to Promote Inclusive Learning and the Implementation of UDI Facilitates/Maximises Learning Outcomes

Variables	Constructs of the frameworks	Correlations Coefficient
Factors to be Considered for Implementation of UDI to Promote Inclusive Learning	UDI	(0.475*, $p < 0.05$)
Implementation of UDI Facilitate/Maximise Learning Outcomes	UDI	

Table 6. 15: Factors to be considered for implementation of UDI vs. maximised learning outcomes

Results indicate that there is a positive correlation between factors to be considered for the implementation of UDI and implementation of UDI facilitates/maximises learning outcomes. It was evident in section 6.6.3 that factors considered for the implementation of UDI to promote inclusive learning will facilitate/maximise learning outcomes for SWVDs in the classroom. Factors may include the need for space to facilitate orientation and mobility, lighting, access to technology and online access for students who are blind and partially sighted. Section 6.6.4 (Figure 6.9) showed how students rated important factors to be taken into consideration for the implementation of UDI at the university. To ensure that SWVDs will have opportunities to learn, participate and express what they know on an equal level as other students, UDI is an appropriate strategy to be applied at the university. Dutta (2013) suggested that the learning environments can be assessed to ascertain its feasibility to

improve the education of SWVDs. The Universal Design of Instruction was introduced in South Africa at a workshop held at the University of Cape Town in 2011, where Dalton et al. (2012) revealed the simplicity of UDI implementation and promoted its potential usefulness. However, UDI systems in South Africa are slow and only partial.

6.8.4 Implementation of UDI in the Classroom and Implementation of UDI Facilitates/Maximises Learning Outcomes

Variables	Constructs of the frameworks	Correlations Coefficient
Implementation of UDI in the Classroom	UDI	0.537*, $p < 0.05$.
Implementation of UDI Facilitate/Maximise Learning Outcomes	UDI	

Table 6. 16: The implementation of UDI vs. facilitates/maximises learning outcomes for SWVDs

The significance of the positive correlation implied that the implementation of UDI in the classroom can result in maximised learning outcomes for SWVDs (refer to the graphical representation in Figure 6.8). Heylighen (2014) emphasised that UDI implementation required an approach that is context appropriate and one that involves both designers and users of the classroom to obtain its maximum benefit. This implied that SWVDs should be involved with the nature of the design, providing direct experiences in shaping the design through relevant personal experiences in having a physical disability or being blind, which can have significant implications for its application.

Munene (2017) confirmed that the implementation of UDI can be constructively used as a driving mechanism to uphold institutional values and contribute to combating the challenges that SWVDs face, thereby maximising learning outcomes. These findings were backed by several scientific research studies that have shown positive learning outcomes through UDI implementation (De Montfort University, 2019; Munene, 2017; Bhattacharya, 2017).

6.8.5 Application of the principles of UDI can Foster Good Relationships and Factors to be Considered for the Implementation of UDI to promote inclusive learning

Variables	Constructs of the frameworks	Correlations Coefficient
Application of the principles of UDI can foster good relationships	Systems Theory -Reciprocal relationships -working in collaboration	0.492*, $p < 0.05$
Factors to be considered for implementation of UDI to promote inclusive learning	UDI	

Table 6. 17: Application of the principles of UDI can foster good relationships vs. Factors to be considered for UDI implementation

There was a positive correlation between ‘application of the principles of UDI can foster good relationships and factors to be considered for implementation of UDI to promote inclusive learning’. The flexibility of a design such as UDI enables SWVDs to participate in activities promoting interaction amongst students and instructors (Dutta, 2013). The implementation of UDI at the university will compensate for the services of the DSU and enable reciprocal interactions between SWVDs and all relevant stakeholders to ensure educational equity in the classroom. The relevant factors are explored in section 6.6.4. Universities in other parts of the world from both developed and other developing countries are using the Principles of UDI to foster good relationships by considering the factors for implementation of UDI to promote inclusive learning. Universities in developed countries and their progression in terms of inclusivity can inform how South African universities can foster good relationships between SWVDs and all stakeholders to remain competitive on a global scale (Munene, 2017).

6.8.6 Applying UDI will Result in Enhanced Academic Capabilities and the Implementation of UDI in the Classroom

Variables	Constructs of the frameworks	Correlations Coefficient
Applying UDI will Result in Enhanced Academic Capabilities	Sen's capability model (enhanced capability)	0.652**,p<0.05
the Implementation of UDI in the Classroom	UDI	

Table 6. 18: Applying UDI will Result in enhanced Academic Capabilities vs. the Implementation of UDI in the Classroom

Results revealed a strong positive correlation between ‘applying UDI can result in enhanced academic capabilities and the implementation of UDI in the classroom’. This indicates that applying UDI in the classroom will enhance the academic capabilities of SWVDs. Students with visual disabilities have existing capabilities that can be enhanced provided that the circumstances or the university environment enables SWVDs to use those capabilities to enhance their functions or actions. The implementation of UDI encourages innovative teaching styles, instructional materials and educational goals designed and modified to meet the need of SWVDs. This enhances the capabilities of SWVDs and reducing the consequences of disability by increasing opportunities to satisfy their basic need for quality education (Dubois and Trani, 2009). On the contrary, restrictions and limitations of functioning in the classroom that are not compensated for by adaptation of course materials and teaching strategies exacerbate their situation in a mainstream classroom (Dubois and Trani, 2009). Students have indicated that there is little compliance for the implementation of UDI in the Classroom in Section 6.6.1.3 of Figure 6.4.

6.8.7 Applying UDI Enhances Capabilities for SWVDs and Challenges Should be Addressed by all Stakeholder at the University

Variables	Constructs of the frameworks	Correlations Coefficient
Applying UDI Enhance Capabilities for SWVDs	Sen's Capability Approach - Enhanced Capabilities	0.570**, p<0.05
Challenges should be Addressed by all Stakeholder at the University	Systems Theory - Working collaboratively	

Table 6. 19: Applying UDI enhance capabilities for SWVDs vs. Challenges should be addresses by all stakeholders at the university

The outcome of the results revealed a strong positive correlation between ‘applying UDI to enhance capabilities for SWVD and challenges should be addressed by all stakeholders at the university’. This implied that the implementation of UDI will allow all stakeholders at the University to address challenges collaboratively, resulting in improved teaching and learning conditions and thereby enhancing the capabilities of SWVDs. With reference to Figure 6.12 in section 6.6.5.3, a majority of students agreed that the application of UDI in the classroom can maximise learning outcome for SWVDs and enable all stakeholders to work collaboratively in a system within the classroom, promoting shared responsibility through Social interaction of SWVD, lecturers and other students and participation of SWVDs in all aspects of learning in the classroom. A universal system such as UDI can be implemented where it can ensure that all stakeholders at HEIs are informed, well-equipped and trained to make teaching and learning adaptive to provide quality education and holds great potential to meet the needs and capabilities of SWVDs (Schiemer, 2017). When SWVDs can exercise their individuality and capabilities, they can participate fully in that society to achieve self-actualisation.

6.8.8 The Application of UDI Enhances Capabilities for SWVDs and Application of the Principles of UDI can Foster Good Relationships

Variables	Constructs of the frameworks	Correlation Coefficient
Applying UDI	Sen's Capability Approach	

Enhances Capabilities for SWVDs	(enhanced capabilities)	0.646**, $p < 0.05$
Application of the Principles of UDI can Foster Good Relationships	Systems theory (collaborative and reciprocal relationships)	

Table 6. 20: Applying UDI enhance capabilities for SWVDs vs. application of the Principles of UDI can foster good relationships

The results indicate that the Application of UDI will enhance capabilities which will in turn foster good relationships within the classroom. A majority of participants agreed that UDI will enhance capabilities in the classroom through collaborative and reciprocal relationships (give-and-take actions) with the Disability coordinator, lecturer, other students and all relevant stakeholders (refer to Figure 6.12). Godden and Hsy (2015) agreed that the implementation of UDI is necessary to merge SWVDs into the classroom with able-bodied students, encouraging mutually beneficial relationships. Enhanced capabilities make people autonomous and autonomy leads to possibilities to achieve well-being, quality of life, equity and equal opportunities for all people (Schiemer, 2017). Section 6.6.5.4 in Figure 6.13 reflected a high level of agreement by SWVDs that enhanced capabilities and increased autonomy in learning.

6.8.9 UKZN's compliance with the principles of UDI and Current Challenges in Learning for Students with Visual Disabilities

Variables	Constructs of the frameworks	Correlations Coefficient
UKZN's compliance with the principles of UDI	UDI	(-0.435*, $p < 0.05$)
Current Challenges in Learning for students with visual disabilities		

Table 6.21: Compliance with UDI vs. Current Challenges

The findings revealed an inverse relationship between ‘compliance with UDI and current challenges’. This implied that poor compliance inversely affects challenges in the teaching and learning of SWVDs in the classroom. At present, section 6.6.1.2, Table 6.5 indicated a lack of UDI compliance. Hence the 7 principles of UDI are not being used to enhance classroom activities for SWVDs, nor is it used to make education more accessible (refer to the graph in 6.6.1.3). If UDI is not effectively applied within the classroom, there can be no positive correlation or relationship and this will adversely impact on challenges that SWVDs experience in the current classroom environment. Several studies revealed that disability systems such as UDI appear to be beyond the reach of South Africa because of their limited resources and inadequate enforcement and adherence to policy (De Montfort University 2019; Munene, 2017; Bhattacharya, 2017). Therefore, to be competitive on a global scale, UKZN requires being more UDI-compliant to achieve a universal system that supports inclusivity and that enhances academic learning and pedagogy holistically through UDI implementation.

6.8.10 Principles of UDI and Challenges Should be Addressed by all Stakeholders at the University

Variables	Constructs of the frameworks	Correlations Coefficient
7 Principles of UDI	UDI	(-0.449*, $p < 0.05$)
Challenges Should be Addresses by all Stakeholders at the University	Systems Theory: Working in Collaboration	

Table 6. 22: Seven Principles of UDI vs. Challenges should be addressed by all Stakeholders at the University

The results revealed an inverse or negative relationship between the 7 Principles of UDI and challenges that should be addressed by all stakeholders at the University. This implied that it is unlikely that challenges will be addressed by all Stakeholders at the University without the application of the 7 principles of UDI. Universal Design of Instruction motivates for the collaborative efforts of all stakeholders at the university to minimising barriers in the

teaching and learning environment, address challenges and encourage the persistence of SWVDs in their educational endeavours (Wessel et al., 2009). The discussion in 6.6.5.3 and Figure 6.12 clearly outlined that the application of UDI in the classroom will maximise learning outcomes for SWVDs holistically (94%) and enable all stakeholders to work collaboratively (94%) in a system within the classroom facilitating teaching and learning. Thus, a lack of the involvement of all stakeholders in the affairs of SWVDs will exacerbate their challenges.

6.8.11 Current Learning Experiences in the Classroom and Factors to be considered for the Implementation of UDI to Promote Inclusive Learning

Variables	Constructs of the frameworks	Correlations Coefficient
Current Learning Experiences in The Classroom	Social Model - Interaction of SWVDs, Lecturers and other students	(-0.670**,p<0.05)
Factors to be Considered for Implementation of UDI to Promote Inclusive Learning	UDI	

Table 6. 23: Current Learning Experiences in the Classroom vs. Factors to be considered for the implementation of UDI to promote inclusive learning

The findings indicated that a strong inverse relationship exists between ‘current learning experiences in the classroom and factors to be considered for implementation of UDI to promote inclusive learning’. The current learning experiences of SWVDs do not indicate inclusive learning as factors of UDI have not been considered for the equalisation of education for all. Section 6.6.4 investigates the factors necessary for the implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom. The results revealed that SWVDs are experiencing difficulties with the current setup in the classroom (Refer to section 6.6.1.4). Due to the lack of consideration for the factors for UDI implementation, current learning experience of SWVDs in the classroom were adversely impacted resulting in for instance over 86% suggesting a re-evaluation of courses in consideration to UDI and 100% agreeing on re-designing of lecture rooms according to UDI

principles. Pearson and Koppi (2002) agreed with Ngubane-Mokiwa (2016) that barriers to accessibility can be overcome through awareness of design issues because UDI simplifies the classroom experience by designing environments and providing services that are usable by all learners. This aligns with UDI principle 4, perceptible information which emphasises that the design should benefit all who use it (Burgstahler, 2018).

6.9 Chapter Summary

This chapter presented the quantitative analysis and discussion focusing on informative and detailed quantitative statistics obtained through a survey method. The quantitative analysis served as a valid means to support or refute findings from the qualitative analysis with reference to the research questions and the theoretical frameworks. Statistical methods applied using quantitative techniques tested the plausibility of the qualitative data and vindicated its accuracy. The results were presented and discussed using descriptive statistics in the form of graphs, cross tabulations and other figures for the quantitative data that was collected. Reliability and validity were discussed as aspects of precision where Cronbach Alpha scores indicated a high degree of reliability. A section analysis evaluated the implementation of UDI to promote inclusive learning; facilitate learning outcomes for SWVDs in the classroom; explore the experiences of SWVDs, group work and current learning experiences and teaching practices in the classroom. Furthermore, the 3 models underpinning the study were statistically evaluated to validate their applicability. Inferential techniques included the use of correlations and chi square test values, which were interpreted and then produced the quantitative results. These were then supported with valid arguments and discussions, literature and other theories. The correlations by themes were performed on the results in relation to the constructs of the relevant theoretical frameworks. The next chapter will involve the triangulation of both qualitative and quantitative results to highlight key findings of the study in line with the research questions. It will further provide the conceptual UDI model for students with visual disabilities in the classroom based on the findings related to the theoretical models applied in the study.

Chapter Seven

Triangulation and Model Formulation

7.1 Introduction

The previous two chapters presented a detailed analysis and discussion of the qualitative and quantitative results. The researcher found it appropriate to provide a triangulation as a means to interpret the results to highlight the findings of the study in this chapter. Therefore, the results are brought together to inform the findings in relation to the research questions and presented in a structured way with relevant references to the discussion and arguments made in chapters 5(qualitative analysis) and 6(quantitative analysis). Furthermore, the findings will be presented in relation to the applied theoretical frameworks to verify what the results are conveying with regard to the proposed implementation of a Universal Design of Instruction to enhance teaching and learning for SWVDs in the classroom. The frameworks underpinning the study are applied via the results of the study to inform the new conceptual model, which is also presented.

7.2 Findings in relation to the research questions

The main research question of the study was:

- a) How can the Universal Design of Instruction promote epistemological access for students with visual disabilities in the classroom?

The following sub-questions were used to address the research questions.

7.2.1 What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?

The experiences of SWVDs were primarily negative as the classrooms were not found to be conducive to learning.

Findings show a complete lack of UDI compliance (refer to section 5.7.1.1) as several SWVDs indicated dissatisfaction with provisions to accommodate their different visual disability needs. The qualitative analysis revealed that course content was mainly presented using projectors and lecturers have not implemented strategies to meet the varying learning styles of SWVDs. Projector slides were meant to aid in the explanation of concepts, but SWVDs could not see the slides which hindered their understanding of the meaning of concepts. Respondents agreed that the presentation of the course content was highly restrictive. It was found that SWVDs were expected to complete their class activities within the same time-frame as other students.

It was further confirmed that SWVDs do not have the relevant software installed on their laptops and do not have the computer expertise to access the content from the online system. Participants divulged that they were not provided with appropriate seating space to meet their specific needs causing delays for SWVDs to adjust to the lecture (refer to section 5.7.1.1, b). Students with visual disabilities expressed in their dialogues that they should be able to access online resources regardless of their disability, technology or environment because the main objective of UDI is to provide access to education for diverse learners. Although participants conveyed that they are aware of inclusivity, they do not see its implementation as many have difficulty reading the notes, notes are not in the appropriate formats at the time of the lesson and notes are not compatible with available assistive technologies (refer to section 5.7.1.1, c). This resulted in SWVDs not being able to participate or interact within the classroom. The course content is not communicated in adjusted formats so that all students can engage and be part of the lesson at the same time. Hence, SWVDs did not receive the information effectively and did not understand the concepts that were presented to them.

Furthermore, students with visual disabilities experienced technical challenges with their assistive software, with limited support from academics and other staff who did not fully understand the needs of SWVDs (section 5.5.1.1, f). While several SWVDs embraced online platforms as it contributed to their independence, some interviewees argued that students from rural communities faced challenges in accessing data due to a lack of adequate network coverage; the requisite technology and having to work in non-conducive environments to advance in their education (refer to section 5.5.12). In addition, assistive devices used by

SWVDs meant to improve access to course content such as recorders proved to have several flaws with the recording of lectures (refer to section 5.5.2.4, b). Accessing computer LANs proved to be time-consuming due to where the LANs were situated in relation to the Colleges (Refer to section 5.5.2.2, a). The participants conveyed that additional limitations included poor lighting (Refer to section 5.5.2.4, a), group activities (5.5.3) and practical work (5.5.2.2, c) that excluded SWVDs and made them reliant on the assistance of other students in the classroom. Furthermore, the university is not UDI compliant in providing curriculums that are inflexible and fails to serve the diversity of students in their classrooms. The system lacks equitable use evident from interviews of SWVDs who did not benefit from learning activities as they did not have their notes in appropriate formats and found it difficult to understand as they could not see what was presented to them.

It is evident that SWVDs are significantly disadvantaged in the classroom, leading to a lack of engagement, non-participation and exclusion. This was further supported by statistics illustrated in Figure 6.3 (section 6.6.1.1) where the majority of SWVDs were not familiar with UDI, indicating a lack of the application of such principles in the classroom. The statistics from Figure 6.4 revealed that UDI compliance was needed at UKZN as it provided a variety of instructional methods and learning techniques, in addition to traditional lectures to create a more inclusive environment for SWVDs in the classroom. The provision of sources of information is not easy to use and does not accommodate a wide range of individual preferences and abilities.

Results in section 6.6.1 (Figure 6.5) illustrated that the current learning experiences of SWVD were fraught with difficulties due to a lack of UDI. Section 6.6.1.5 (Figure 6.6) concerning group work revealed that due to assistive devices and other adaptations to fonts SWVDs find it difficult to interact and participate in group activities and did not feel a sense of belonging to the group. Additionally, both qualitative and quantitative analyses discovered that course designs are not user-friendly and do not communicate material easily and effectively. This collectively indicates the poor applicability of UDI principles in the classroom for SWVD that led to challenges and negative experiences in the classroom.

Currently, the primary coping mechanism for SWVDs is the Disability Support Unit (DSU) and it plays a key role in enhancing the classroom experience for SWVD, being mainly responsible for initiating solutions to problems experienced in the classroom. However, this negates the concept of UDI because the University should be more UDI-compliant.

7.2.2 What are the current challenges in learning for students with visual disabilities in the classroom?

The qualitative findings in Section 5.5.2 revealed several challenges that SWVDs face in the classroom. It is apparent from the responses that SWVDs are not well supported in the classroom due to deficiencies in lecturers' preparation skills for inclusive education practice. Findings in Section 5.5.2.1 revealed that lecturers lacked awareness of how visual impairment affects student interaction and participation in the classroom. Their entrenched attitudes led to the unwillingness to change activities. As such, the lack of reasonable accommodation excludes SWVDs from participating and is not in line with inclusive practices in the classroom. There was a lack of continuity as lecturers forget and do not follow through after being provided with motivation letters. Furthermore, challenges included SWVDs' lack of technological skills and time constraints with regard to familiarising one's self with the current online learning system.

Findings in Section 5.5.2.2 revealed tremendous challenges with course content. Students with visual disabilities experienced difficulty in the classroom as they are unable to relate to the course content to engage in the lesson. It was not only time-consuming to make arrangements to acquire the relevant content and notes, but also difficult to keep up to date with work in progress. Uploaded notes were incompatible with the available software meant to assist them to read the notes (JAWS) compounded with the additional challenge of reformatting proved to be time-consuming. In addition, students with visual disabilities grapple with graphical representations and photographs that cannot be reformatted and applied to the JAWS. Students disapproved of the use of small font size as it discouraged attendance because lecturers are not adapting classroom materials and procedures to accommodate the needs of SWVDs in the classroom.

Section 5.5.2.3 revealed that SWVDs struggled to adapt to the current exam set-up at the university as they were not familiar with the process. In addition, it was found in Section 5.5.2.4 that physical access issues arose due to difficulties with full venues, poor lighting and difficulty acquiring relevant seating to accommodate their needs within the classroom setting. In addition, Section 5.5.3 revealed that SWVDs found it more challenging to work in groups because having a disability can influence perceptions causing stigmatisation. Therefore, some SWVDs were discouraged to disclose their disability status to receive the necessary

accommodations. In addition, due to the use of assistive devices, modifications and other adaptations to fonts SWVDs require from out of the classroom prevented them from interacting in group assignments held within the classroom.

The above was further supported by quantitative statistics in relation to current challenges in learning for students with visual disabilities in the classroom. The quantitative statistics revealed in Figure 6.7 that SWVDs are experiencing difficulty engaging with the lecturers who do not understand and have problems adapting to the course content and current support provided (60%). The findings in support of the qualitative analysis revealed that the majority believe they were compelled to learn like mainstream students and therefore lack motivation and found it difficult to engage with the lecture content due to a classroom climate that is not conducive to SWVDs. Section 6.9.1 revealed an inverse relationship between compliance with UDI and current challenges, meaning that an increase in UDI compliance will decrease challenges in the teaching and learning of SWVDs in the classroom.

7.2.3 How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?

There was general agreement among participants that UDI incorporation can enhance learning outcomes for SWVDs in the classroom (refer to section 5.7.2). Results implied that there will be enhanced learning outcomes with the implementation of UDI in the classroom.

Conversations with SWVDs in section 5.7.2.1 revealed that they are aware that UDI is all about improving access. Students believe that UDI implementation will help them become more involved in their studies providing flexibility to use specific capabilities to maximise their ability to understand content to enhance learning. There was a general agreement amongst respondents that they will spend less time trying to source appropriate formats for notes and more time engaging with course material as all formatting will be available for use and at their disposal in the classroom as and when needed.

Students with visual disabilities expressed concern that they were entering the classroom with limited knowledge and exposure to technology and sophisticated websites that exclude them. However, findings revealed that UDI is appropriate as it simplified the design to provide

easier access to assistive technology/ devices and teaching methods. Students believe that UDI principles allowed them to learn from their mistakes and apply their full potential thereby improving retention and throughput. Findings showed that SWVDs acknowledged that UDI principles will utilise course designs with assistive technology that uses a variety of applications that will provide them with options to access the content multiple times and in different settings. Furthermore, Universal Design of Instruction offers online lectures that allow students access to lectures anytime and at any place.

Results in section 5.7.2.2 revealed that UDI is meant to promote equality for all because, without the implementation of UDI, SWVDs will fall behind in their studies and not be able to participate and compete on an equal level with others in the classroom. Participants expressed confidence that UDI implementation will advance their potential to achieve and improve in their studies. Findings revealed awareness that Universal Design of Instruction provides various strategies such as multimodal teaching and differentiated instruction that eliminate barriers and helped SWVDs to access equitable education. In addition, findings in section 5.7.2.3 indicated that the successful implementation of UDI at the university will greatly improve the confidence, self-esteem and overall performance of SWVDs. Participants favoured the Universal Design of Instruction as it promoted inclusivity through equal participation that fosters belongingness, confidence and esteem that align with Maslow's Model. Findings in section 5.7.2.5 showed several SWVDs anticipate that a UDI system will facilitate knowledge gain; enhance focus on learning as everybody will be catered for; and will cultivate an understanding that will help SWVDs achieve.

The quantitative findings substantiated revelations made in the qualitative analysis above. Statistics in Section 6.6.3 (Figure 6.8) supported the implementation of UDI to facilitate/maximise learning outcomes for students with visual disabilities in the classroom. Respondents agreed that they will be able to learn better in the classroom if the instructor creates a class climate in which student diversity is respected. The respondents predominantly agreed that UDI implementation will enhance their ability to engage with the course content. It was unanimous from the findings that performance in tests and exams can improve and engagement with lecture content will improve as UDI will offer alternate formats in real-time. The majority agreed that it will not require much effort to learn as UDI related technology enhances learning in the classroom. In addition, results revealed that UDI technology will facilitate communication, allow SWVDs to work at their own pace

independently and provide the right device, training and time to improve learning. There was also a positive correlation between the implementation of UDI in the classroom and maximised learning outcomes for SWVDs evident in Section 6.8.4 (Table 6.16). This confirms that to ensure that SWVDs will have opportunities to learn, participate and express what they know on an equal level as other students, UDI is an appropriate strategy to be applied at the university.

7.2.4 What factors must be considered for the implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom?

The qualitative findings revealed that the consensus is that the university can implement UDI (refer to section 5.7.3.1). An institutional understanding of UDI required a culture of change. Student respondents divulged injustices that they faced when lecturers did not adopt positive strategies and did not conform to universal teaching practices. Facilitating UDI implementation required a period of learning and knowledge acquisition by all stakeholders regarding the accommodation of diverse student populations at HEIs (refer to section 5.7.3.1, d). In addition, engagement with SWVDs to assess their needs required the university to consult more widely with SWVDs to recognise what supports are required and put forth a positive culture that addresses potential barriers to learning early in their higher education journey. Students suggest that a better system is required to allow for consultation with various trained personnel at the university to tackle the issues concerning accommodations for SWVDs, requiring a University-wide awareness and collaborated efforts from all stakeholders (refer to section 5.7.3.1, b). Findings further revealed that universal designed principles could foster a teaching and learning system that will meet the requirements of the growing diversity of students in the classroom. This required accommodations and adjustments to the curriculum that some students have identified and as a result feel confident that the implementation of UDI will help them accomplish their goals. It is possible to embrace a new educational perspective such as UDI. However, important factors assessed for accessible course design required adhering to UDI principles that would benefit learning for SWVDs. Equitable use (refer to section 5.7.3.2, a) was highly ranked by SWVDs as it required that Modules are designed to remove barriers to the participation of SWVDs for equal access. Participants agreed that information should be provided in flexible ways to

ensure accessibility to more users minimising the need for special accommodations for those who need it.

Students with visual disabilities favoured the new digital technology that UDI provided as it allowed for online learning which availed different media and formats to SWVDs and more options for presenting information, creative expression and engagement. Another highly ranked factor included flexibility in use (refer to section 5.7.3.2, b) as SWVDs did not always have the necessary skills to be able to use advanced specialised assistive technologies. Furthermore, flexibility in classrooms ensured that there are adequate and appropriate workspaces for students who may require specific seating arrangements to enable them to view the chalkboard or projector screen. Many agreed that Designing for independence, self-reliance and individualism is characteristic of UDI. However in applying UDI principles, one needs to be cognisant of the diversity of human abilities and conditions and choose the most appropriate design within the context of the classroom (refer to section 5.7.3.2, c). Furthermore, it was expected that Tolerance for Error was significant in adopting a UDI system as it minimises hazards and the adverse consequences of accidental or unintended actions (refer to section 5.7.3.2, d).

Quantitative statistics further supported the qualitative findings evident in section 6.8.3 (Table 6.15), whereby a positive correlation shows that that promoting inclusive learning to facilitate/maximise learning outcomes for SWVDs in the classroom requires serious consideration of the factor for UDI implementation. Several respondents agreed that the university did not understand the implications of implementing UDI. Various crucial factors were outlined in Section 6.6.4 of Figure 6.9 where it was unanimous that engagement with SWVD to assess needs was significant to maximise learning outcomes. Furthermore, respondents indicated that it was necessary to have a university-wide awareness that included all stakeholders. A positive correlation was revealed in section 6.8.5 (Table 6.17) that factors to be considered for the implementation of UDI can foster good relationships to promote inclusive learning. The majority of respondents were in favour of re-designing lecture rooms and re-evaluating courses in consideration of UDI principles as the flexibility of a design such as UDI would enable SWVDs to participate in activities promoting interaction amongst students and instructors. Statistics revealed that physical accessibility within the classroom was needed and course content required alternative formatting. The majority agreed that the

listed factors for the implementation of UDI (Section 6.6.4 Figure 6.9) should be taken into consideration in designing curriculum, teaching and learning environments.

The Universal Design of Instruction motivates the collaborative efforts of all stakeholders at the university to minimise barriers in the teaching and learning environment. This was supported by Section 6.8.7 (Table 6.19) where the correlation supported applying UDI to enhance capabilities for SWVD and the mitigation of challenges through all stakeholders at the university. This implied that the implementation of UDI will allow all stakeholders at the university to address challenges collaboratively, resulting in improved teaching and learning conditions and thereby enhancing the capabilities of SWVDs.

7.2.5 What type of model can be conceptualised to incorporate UDI to promote learning outcomes for students with visual disabilities?

Social Model

Section 5.8.1 refers to the Social Model that compelled the university to change perceptions from a qualitative perspective. Students with visual disabilities believed that changing perceptions starts with an improved understanding of challenges they experience through hearing their voices, judgements and feedback about the usability of the educational design. Findings revealed that the university required a proactive stance to empower SWVDs to advocate their views. Furthermore, changing perceptions required awareness initiatives that encouraged working collaboratively toward institutional transformation and classroom diversity. This could be achieved through workshops, conferencing and experiential learning that involved sharing experiences and group reflection. Participants found that understanding coupled with acceptance and empowerment of SWVDs will improve current classroom conditions and promote UDI for implementation. The quantitative findings (Section 6.6.5.2) substantiate the qualitative findings above to confirm the applicability of the Social Model for UDI implementation. A consensus revealed that it can improve social circumstances such as isolation, stigmatisation, discrimination, stereotyping and myths about disability in the classroom by addressing challenges that SWVDs experience. Furthermore, results support that UDI implementation can promote equity and inclusive education supported by the Social

model. There was also strong support in favour of UDI implementation as it can influence change in attitude amongst instructors and students and improved interaction between SWVDs with lecturers and other students in the classroom. Hence, the statistical information demonstrated that the university required re-aligning with the Social Model (Figure 6.11). As such, UDI implementation will afford the university opportunities to create an all-inclusive learning environment through the removal of barriers in the classroom thus, conforming to the Social Model in increasing the quality of that SWVDs received.

Systems Theory

Section 5.8.2 incorporated the constructs of Systems Theory which encouraged working collaboratively as a system to enhance learning in the classroom. The qualitative findings revealed that if the university community worked together in collaboration with their services, it will ensure that the requirements of each student are met, and properly communicated to the relevant sections/departments creating awareness for the provision of optimal conditions. Furthermore, shared responsibility between all stakeholders within the HEI will optimise educational experiences holistically and provide a better understanding and knowledge of what SWVDs need and how to best support them. As such, it was agreed that all stakeholders within the university played an important role in encouraging the persistence of SWVDs to ensure retention and throughput. Participants expressed that all aspects of inclusion and educational equity required interaction of SWVDs and the university community in reciprocal relationships where each person in a relationship interacts with and influences the other. Participants expressed that the implementation of UDI in the classroom will build awareness and ensure equal participation and engagement in the classroom maximising learning outcome for SWVDs encouraging participation of SWVDs in all aspects of learning in the classroom.

In support of the qualitative findings above, quantitative statistics in Section 6.6.5.3 (Figure 6.12) revealed mutual agreement among participants that Systems Theory was applicable for the implementation of UDI. Findings revealed that Universal Design of Instruction in the classroom will encourage engagement, promote disability awareness, encourage re-evaluation of courses and allowed physical accessibility, thus, enhancing learning outcomes in the classroom for SWVDs. Furthermore, through reciprocity (give-and-take actions), learning outcomes for SWVDs can be maximised holistically as all stakeholders will work

collaboratively. The implementation of UDI can promote shared responsibility through social interaction of SWVDs with lecturers and other students, and it will encourage the participation of SWVDs in all aspects of learning in the classroom. Hence, Systems Theory was found applicable as it aligned with the Social Model in promoting a focus on relationships between individuals and their environment with a comprehensive outlook of the entire system.

Maslow's Hierarchy of needs

Maslow's model was shown to be applicable as it concerned enhancing the sense of belongingness and achievement in the same way that UDI promoted inclusivity. Qualitative findings revealed that the implementation of UDI will foster inclusion as it focused on equity, inclusiveness, provoking involvement and a sense of belongingness. Participants were certain that UDI implementation will provide an opportunity to succeed in their endeavours, enhance self-esteem and instil a sense of belonging, motivation and confidence to improve. Results showed that UDI offers a system that exposes lecturers and other students in the classroom to a greater diversity of learner needs, encouraging the acceptance of new ways of teaching and learning, tolerance for diversity and equalisation of opportunities. Findings in Section 5.8.4.2 confirmed that SWVDs want to feel a sense of personal achievement and believed that Universal Design of Instruction will reduce barriers to learning in the classroom. This can promote increased academic achievement, which will help SWVDs feel as academically equal as their able-bodied counterparts. Hence, respondents were confident that an all-inclusive learning environment enriched with reasonable accommodations to support learning would assist them to attain educational fulfilment. The general view about inclusivity was that inclusive teaching and learning practices will be a welcome response that added to SWVDs' confidence to achieve. It was found that flexible classroom environments allow freedom to choose the most appropriate means to approach their studies. Findings in section 5.8.4.6 revealed that UDI will level the playing fields so that all students can learn and participate in the classroom equitably, which they claimed will strengthen feelings of belongingness and enhance self-esteem that will motivate students to perform. The majority agreed that the implementation of UDI was necessary to merge SWVDS as it promoted feelings of acceptance, belonging and recognition. Participants revealed in section 5.8.4.4/5 that by satisfying self-esteem needs, SWVDs will develop self-confidence, which will in turn

encourage participation resulting in feelings of adequacy, thus motivating students to aspire to achieve their desired goals.

The quantitative statistics complemented the qualitative findings. Findings in section 6.6.5.1 Figure 6.10 deal with the applicability of Maslow's Hierarchy of Needs model to conceptualise the incorporation of UDI to promote learning outcomes for SWVDs. The quantitative findings proved that participants agreed in line with Maslow's model that the implementation of UDI will promote equal participation, which will open doors for equal opportunities and effective communication for SWVDS in the classroom. Collectively, all participants felt that UDI will promote a sense of belonging that will satisfy esteem needs through a heightened sense of autonomy and independence. The majority confirmed that it motivated personal confidence levels and allowed for greater academic achievement. The findings represent the application of UDI principles in educational practices in the classroom as they complement and mirrored the constructs of Maslow's (1943/54) Hierarchy of Needs Model.

Sen's Capability Approach

Sen's Capability Approach focuses on ensuring equality and developing human potential which aligned with the principles of UDI as it enhanced the capabilities of SWVDs, thereby reducing the consequences of disability. Therefore, the model was found to be applicable.

Participants felt strongly that UDI implementation in the classroom would support Sen's Capability Approach. The qualitative results indicated that, guided by UDI principles, enhanced capabilities for SWVDs would make them perform better in the classroom. They would get to choose a variety of teaching strategies and opportunities thereby widening choices in learning and encouraging interventions to promote full participation. The general view is that the UDI system will promote self-confidence and belief in one's abilities. In addition, if UDI was successfully in place at the institution, then it would expand the capabilities of SWVDs and thus provide a sense of belongingness ultimately facilitating retention and throughput.

In support of the above qualitative findings, quantitative statistics confirmed in section 6.8.8 (Figure 6.15) that the majority agreed that UDI will enhance capabilities in the classroom

through collaborative and reciprocal relationships (give-and-take actions) with all relevant stakeholders encouraging mutually beneficial relationships. Section 6.5.6.4 (Figure 6.13) considered Sen's Capability Approach as a highly applicable model for the implementation of UDI to maximise learning outcomes in the classroom as it focuses on promoting equal opportunities and equal participation in the classroom, increasing educational development and transformation, increased autonomy and provided opportunities to achieve. The majority agreed that the Capability Approach widened choices and facilitated retention and throughput ensuring equality and developing human potential, which aligned with the principles of UDI to enhance the capabilities of SWVDs and thereby reducing the consequence of disability. Furthermore, Section 6.8.6 (Table 6.13) revealed a strong positive correlation between applying UDI to enhance academic capabilities and the implementation of UDI in the classroom. A high degree of acceptance of the Capability Approach was premised on the notion that it focused on human diversity, providing opportunities for academic achievement. Findings suggested that SWVDs have existing capabilities that can be enhanced, provided that the circumstances or the university environment enable SWVDs to use those capabilities to enhance their functions or actions.

7.3 The Interconnected Theoretical Frameworks that Informed the Proposed Conceptual Model

It was found that each of the applied models overlapped and shared interconnected constructs illustrated in Table 7.1. This helped motivate the applicability of the selected models to inform the proposed UDI model for implementation.

Models	Overlapping and interconnected constructs
Social Model	<ul style="list-style-type: none"> - Promoted a paradigm shift that focuses on relationships between individuals and their environment and directs attention away from individuals and problems viewed in isolation.
Maslow's Hierarchy of Needs	
Systems Theory	
Sen's Capability Approach	<ul style="list-style-type: none"> - A holistic philosophy of inclusion that required a comprehensive outlook of the entire system. - Enhanced capabilities provided a sense of autonomy and Independence opened possibilities to achieve well-being, quality of life, equity and equal opportunities for

	<p>all.</p> <ul style="list-style-type: none"> - Promote self-confidence and belief in ones abilities. - Empowering people to change current social viewpoints. - Reducing the consequence of disability - Respecting human dignity and diversity - Reconceptualise the experience of impairment - Attitudinal change.
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Table 7. 1: The overlapping/ interconnected relationship of the applied models

7.4 Current Absence of UDI Conceptual Model - The Current Realities of Students with Visual Disabilities due to Lack of UDI in the Classroom

The following representation in Figure 7.1 reflects the current realities of students with visual disabilities due to the lack of UDI in the classroom.

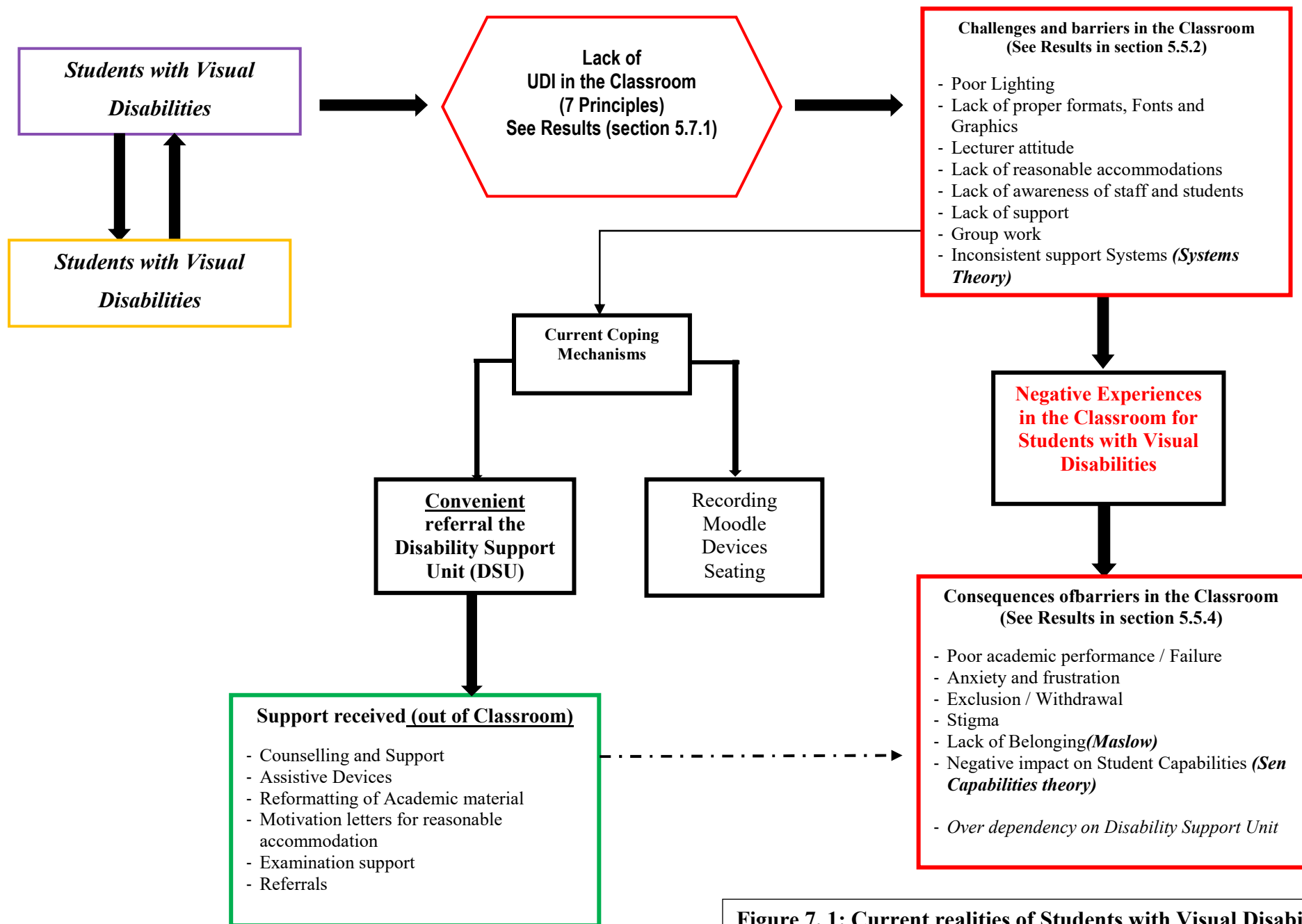


Figure 7. 1: Current realities of Students with Visual Disabilities due to lack of UDI in the classroom

The lack of UDI in the classroom has resulted in various challenges in the classroom, which contributes to the overall negative experiences of SWVDs. Challenges and barriers in the classroom were due to the lack of UDI, which resulted in the locus of the problems being centred directly on the SWVDs. Students with visual disabilities are currently forced to apply their own coping mechanisms. Students with visual disabilities are compelled to arrive early at the lecture venue to secure appropriate seating to be able to properly view lecture content. They also rely on recording of lectures to effectively learn in the classroom. It is apparent that SWVDs are improvising to compensate for classroom activities that exclude them. They are also heavily reliant on the Disability Support Unit to obtain accommodations and support, but they can only be assisted to a certain extent from outside the classroom. Hence, delivering the curricula to diverse learners proved to be a challenge. This eventually leads to negative learning outcomes such as poor academic performance, anxiety, frustration, exclusion/withdrawal and a lack of belonging, amongst other consequences.

7.5 Conceptual UDI Model Implementation in the Classroom

Based on the findings of the study, a new Conceptual UDI Model is hereby developed and proposed. The model is visually depicted in Figure 7.2 and a narrative is provided on how the model can work to enhance the learning outcomes of SWVD in the Classroom through UDI.

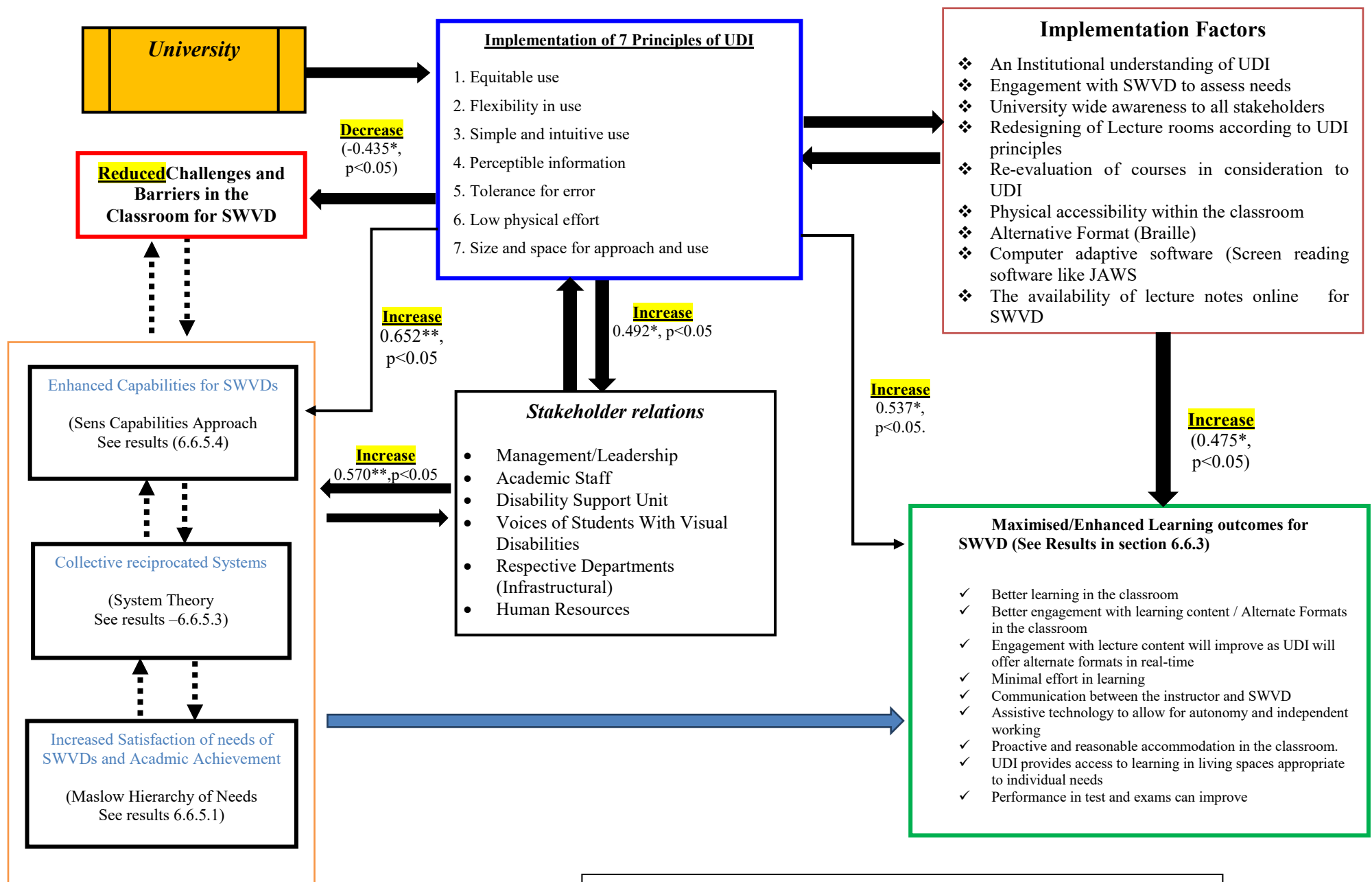


Figure 7. 2: Conceptual UDI Model implementation in the classroom to enhance learning outcomes for Students with Visual

The proposed conceptual model is meant to re-align the University to the Social Model of Disability through UDI. This study draws on fundamental elements that the Social Model presents on the removal of barriers and its role in increasing the quality of life for SWVDs in the classroom.

The model proposed that the implementation of the seven principles of UDI can lead to a decrease in challenges experienced by students in the classroom, thereby lifting barriers to inclusion in the classroom for SWVDs. However, the implementation UDI principles will be dependent on the implementation factors and these factors act as enablers to UDI at the university based on the results of this study. Such factors included understanding, engagement, re-designing and re-evaluation of the environment and teaching methods in consideration of the seven principles of UDI. Furthermore, it required the availability of course content in alternative formats, supported by assistive computer software and the availability of online notes.

Once successfully implemented, UDI can cultivate collaborated and reciprocal stakeholder relations to ensure educational equity in the classroom. As such, embracing a new educational perspective aligned to the seven principles of UDI will in turn promote an all-inclusive classroom environment that will increase the satisfaction of the needs of SWVDs and enhance academic achievements.

As mentioned, the implementation of UDI can also combat challenges. As such, it will enhance the capabilities of SWVDs by focusing on ensuring equality and developing human potential in line with the principles of UDI, thereby reducing the consequences of disability by increasing opportunities for SWVDs. In addition, it will improve stakeholder interaction to address challenges collaboratively, resulting in improved teaching and learning conditions and thereby enhancing the capabilities of SWVDs in the classroom and providing collective and unified reciprocal systems based on stakeholder collaboration. This can also promote increased student satisfaction and will promote well-being and a sense of belonging that can enhance academic achievement in the classroom, linked to the Maslow Model.

Maximised learning outcomes for SWVDs in the classroom can then be achieved, thereby promoting:

- Better learning in the classroom

- Better engagement with learning content / Alternate Formats in the classroom
- Engagement with lecture content will improve as UDI will offer alternate formats in real-time
- Minimal effort in learning
- Communication between the instructor and SWVDs
- Assistive technology to allow for autonomy and independent working
- Proactive and reasonable accommodation in the classroom.
- UDI provides access to learning in living spaces appropriate to individual needs
- Better performance in test and exams

Overall, the conceptual model supports the Social Model of disability. Therefore once UDI is implemented, a paradigm shift is imminent. Conforming to the Social Model of Disability will shift focus from the student displaying the disability to an all-inclusive classroom that supports quality education for all. Currently, the University of KwaZulu-Natal does not support the Social Model that favours enhanced learning outcomes for SWVDs in the classroom. However, applying the UDI principles and if successfully implemented will subscribe to the Social model elegantly transforming the traditional learning environment.

7.6 Chapter Summary

This chapter explored the findings of the study in relation to the research questions. It triangulated the quantitative and qualitative results to support the findings. The findings explored the applicability of the selected theoretical frameworks in conjunction with UDI principles. The frameworks underpinning the study were applied via the results of the study to inform the new conceptual model. Subsequently, the conceptual model was proposed which was underpinned by four interconnected applicable models supported by the findings from both the qualitative and quantitative analysis of the study. The study evaluated the current realities of students with visual disabilities due to the lack of UDI principles in the classroom to prepare a platform for a new perspective that motivates the application of a UDI model to provide numerous opportunities to enhance retention and increase throughput. The proposed implementation of a Universal Design of Instruction Model can be applied at the institution with the potential for other Higher Education Institutions in South Africa with an agenda to transform and enhance the teaching and learning experience for students with

visual disabilities in the all-inclusive classroom. The next chapter is the final chapter as it provides the conclusions and recommendations of the research and draws the study to a close.

Chapter Eight

Conclusion and Recommendations

8.1 Introduction

The previous chapter outlined the key findings derived from the study. This chapter summarises the research findings in relation to the research problem and ascertains if the study fulfilled its intended purpose and whether the problem has been addressed. The chapter recaps the problem statement, research questions and objectives, and establishes whether the research questions have been answered and objectives fulfilled. Due to the inductive nature of the qualitative analysis, this chapter provides various important recommendations that emerged through this process. The chapter outlines the limitations of the study, provides direction for further research and draws the study to a close.

8.2 An overview of the Problem Statement

Chapter 1 introduced the research problem of the study where it was emphasised that SWDs remain excluded despite the existence of legislature and accessibility policies that support inclusivity and encourage universal models of support to enhance the learning outcomes and experiences of SWDs in the classroom. There has been a significant increase in the number of SWDs in Higher Education in recent years, which ignited a need for transformation. Furthermore, it prompted the university to modify its curricula, instruction, assessment and environment to address the needs of SWDs to conform to its core value of promoting inclusiveness. Students with visual disabilities (SWVD) made up a significant number of the total number of students with disabilities due to their learning being greatly hindered in the inaccessible classroom environment. However, historically, little focus has been made on SWVDs in the classroom setting. Hence, this study capitalised on the opportunity to address this gap by focusing on SWVDs in a Higher Education context. The study therefore made an empirical investigation into the possible implementation of Universal Design for instruction

as a potentially unique approach to enhance learning outcomes in the classroom for SWVDs at one of the largest universities in the country and on the African continent, that being the University of KwaZulu-Natal.

There is an abundance of research on UDI in Higher Education in developed countries, along with other developing countries globally. The Universal Design of Instruction has also been widely incorporated at other leading universities globally as a strategic intervention to foster inclusivity. However, there is a paucity of research on the incorporation of UDI in the HE classroom in South Africa as well HEI across the continent of Africa. This study therefore aimed to address this gap with a focus on exploring the potential of Universal Design of Instruction in promoting inclusivity to enhance learning for SWVDs in the HE classroom. The study adds value to the research area and will also be the first of its kind to examine UDI as a proposed model for SWVDs in the classroom at a South African university. The background to the problem in Chapter 1 further supported the need for the study and led to the formulation of the research question, sub-questions and objectives of the study.

8.3 The Research Questions

The research problem presented the following key research question to be answered:

The main research question:

How can the Universal Design of Instruction promote epistemological access for students with visual disabilities in the classroom?

The study will utilise a series of sub-questions to address the research question.

Sub-Questions

1. What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?
2. What are the current challenges in learning for students with visual disabilities in the classroom?

3. How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?
4. What factors must be considered for the implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom?
5. What type of model can be conceptualised to incorporate UDI to promote learning outcomes for students with visual disabilities?

8.4 Objectives

The objectives of this study were thus:

1. To examine the experiences of students with visual disabilities in relation to current teaching practices in the classroom;
2. To determine the challenges experienced in learning for students with visual disabilities in the classroom;
3. To explore the potential of UDI implementation to facilitate/maximise learning outcomes for students with visual disabilities in the classroom;
4. To identify factors that can influence the implementation of UDI for inclusive learning for students with visual disabilities in the classroom; and
5. To propose a conceptual model that can incorporate UDI to promote learning outcomes for students with visual disabilities.

8.5 Have the Research Questions been answered?

This section will ascertain whether the research questions have been answered.

8.5.1 What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?

In answering the above research question, the findings from both the quantitative and qualitative analyses indicate that the current learning experience of students in the classroom was compromised due to a lack of UDI. Their overall experience was found to be negative and laden with difficulties in the classroom, hindering learning ability. The university was not UDI compliant, providing curricula that are inflexible and fail to serve the diversity of

students in their classrooms. The experiences of SWVDs were primarily negative as the classrooms were not found to be conducive to learning. Some of the problem areas included difficulty reading the notes as notes are not in the appropriate formats at the time of the lesson, and notes are not compatible with available assistive technologies. Furthermore, SWVDs were dissatisfied with the lack of provision to accommodate their different visual disability needs in the classroom. Currently, they relied heavily on the Disability Support Unit which greatly assisted them in reformatting and other related support, but it did not solve the problems experienced in the classroom. The Disability Support Unit was a non-academic department based in the support sector of the university and was seen as a convenient reference point for SWVDs by the Academic sector. Universal Design of Instruction implementation was appropriate as it was derived from basic teaching strategies where adjustments to formats can improve time constraints and access to course content, thereby enhancing the experiences of SWVDs in the classroom. Therefore, the university requires a universal design system that ensures that learning and instruction are inclusive and presented in flexible formats in every classroom to increase the epistemological access and independence of all students.

8.5.2 What are the current challenges in learning for students with visual disabilities in the classroom?

Students with visual disabilities were compelled to learn like able-bodied students and therefore lacked motivation and found it difficult to engage with the lecture content due to a classroom climate that is not conducive to SWVDs. There was a dire need for changes in the negative attitudes of lecturers in the classroom, which led to several challenges for SWVDs face due to a lack of inclusive educational practices. Lecturers lacked awareness of how visual impairment affects student interaction and participation in the classroom. They did not adapt classroom materials and procedures to accommodate the needs of SWVDs in the classroom, such as small font sizes that discouraged attendance. Findings revealed the tremendous challenges SWVDs encountered with course content. This compelled SWVDs to apply coping mechanisms as they are unable to relate to the course content to engage in the lesson. Furthermore, SWVDs had to improvise to compensate for classroom activities that exclude them. Other findings revealed that challenges and barriers in the classroom were due to the lack of UDI, which resulted in the locus of the problems being centred directly on the

SWVDs. This led to negative learning outcomes such as poor academic performance, anxiety, frustration, exclusion/withdrawal and a lack of belonging, amongst other consequences. Hence, delivering the curricula to SWVDS in the classroom required universally designed methods and practices that accommodated the needs of SWVDs to the greatest extent possible in order to address challenges and improve the current situation in the classroom.

8.5.3 How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?

In response to the above question, the study's findings reflected that several SWVDs anticipated that UDI implementation will facilitate knowledge gain; enhance focus on learning as everybody will be catered for; and will cultivate an understanding that will help SWVDs achieve. Results revealed that UDI is appropriate as it simplified the design to provide easier access to assistive technology/devices and teaching methods. The findings supported that UDI incorporation can enhance learning in the classroom as it allowed SWVDs to learn from their mistakes and apply their full potential, thereby improving retention and throughput. Findings revealed that UDI principles incorporated in course designs with universally designed assistive technology can provide SWVDs with options to access the content multiple times, as required and in different settings, with the availability of a variety of technological applications. Furthermore, UDI implementation encouraged involvement by providing flexibility to use specific capabilities to maximise understanding and enhance learning.

In addition, UDI can maximise learning outcomes as SWVDS will spend less time trying to source appropriate formats for notes and more time engaging with course material since all formatting will be available for use and at their disposal in the classroom as and when needed. However, this will be heavily reliant on accessible systems, reliable methods of instruction and enabling classroom environments that provide freedom of choice and enhanced the ability of the individual to live independently. Therefore, maximising learning outcomes required that the university fulfils its obligation to provide inclusive learning environments and explore strategies to develop and nurture the learning of SWVDs.

Noteworthy correlations between the implementation of UDI in the classroom and maximised learning outcomes for SWVDs were evident, implying that to ensure that SWVDs will have

opportunities to learn, participate and express what they know on an equal level as other students, UDI is an appropriate strategy to be applied at the university.

8.5.4 What factors must be considered for the implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom?

The implementation of the seven principles of UDI can lead to a decrease in the challenges experienced by students in the classroom, thereby lifting barriers to inclusion in the classroom for SWVDs. However, the implementation of UDI principles will be dependent on the implementation factors and these factors act as enablers to UDI at the university, based on the results of this study. Several factors emerged through the study's findings, which included an institutional understanding of UDI; engagement with SWVDs to assess needs; re-designing of the lecture rooms; re-evaluation of the courses in consideration of UDI; re-evaluation of the environment and teaching methods in consideration of the seven principles of UDI. Furthermore, factors included ensuring physical accessibility within the classroom; the use of assistive formatting such as Braille; computer adaptive software such as screen reading software (JAWS); and the availability of lecture notes online for SWVDs. The factors ensured accessibility to more users, minimising the need for special accommodations. In line with UDI, these factors offered a simplified design for easier access to teaching and learning methods and ensured an adequate and appropriate workspace for students who may require specific arrangements within the classroom.

The significant positive correlations revealed that promoting inclusive learning to facilitate/maximise learning outcomes for SWVDs in the classroom requires serious consideration of the factors for UDI implementation. Due to the lack of consideration for the factors for UDI implementation, the current learning experiences of SWVDs in the classroom were adversely impacted, resulting in the re-evaluation of courses in consideration of UDI and re-designing of lecture rooms according to UDI principles. To embrace a new educational perspective such as UDI, important factors to be assessed for accessible course design required adhering to UDI principles that would benefit learning for SWVDs.

8.5.5 What type of model can be conceptualised to incorporate UDI to promote learning outcomes for students with visual disabilities?

In response to the above research question, the study evaluated the applicability of selected theoretical frameworks to conceptualise a UDI Model to promote learning outcomes for students with visual disabilities in the classroom. Through the study findings, a proposed conceptual UDI model for implementation materialised, supported by statistical correlations and the lived experiences of students with visual disabilities.

- **The Social Model**

Through the analysis of the selected models of disability, the study aims to re-align the university to the Social Model of Disability, which it proposes to change the focus from students with visual disabilities to the inaccessible HE environment. The study found that UDI implementation can promote equity and inclusive education supported by the Social Model. This study draws on fundamental elements that the Social Model presents on the removal of barriers and its role in increasing the quality of life for SWVDs in the classroom.

- **Systems Theory**

The constructs of Systems Theory were found applicable to inform the conceptual UDI Model for implementation. Several constructs were incorporated from the Systems Theory framework. This included working together in collaboration of services to ensure that the requirements of SWVDs are met and properly communicated to the relevant sections/departments, creating awareness for the provision of optimal conditions. Shared responsibility between all stakeholders within the HEI was another significant construct that was considered as it provided a holistic understanding and knowledge of what SWVDs need and how to best support them. All aspects of inclusion and educational equity required the interaction of SWVDs and the university community in reciprocal relationships where each person in a relationship interacts with and influences the other. Systems Theory aligns with UDI and the Social Model in promoting a paradigm shift that focuses on relationships between individuals and their environment, and directs attention away from individuals and problems viewed in isolation.

- **Maslow's Hierarchy of Needs**

Maslow's model was shown to be applicable as it concerned enhancing the sense of belonging and achievement in the same way that UDI promoted inclusivity. Findings revealed that the implementation of UDI can foster inclusion as it focused on equity, inclusiveness, provoking involvement and a sense of belonging. Findings also revealed that UDI implementation can provide an opportunity for SWVDs to succeed in their endeavours, enhance self-esteem and instil a sense of belonging, motivation and confidence to improve. Hence, respondents were confident that an all-inclusive learning environment enriched with reasonable accommodations to support learning would assist them to attain educational fulfilment.

- **Sen's Capability Approach**

The implementation of UDI can enhance the capabilities of SWVDs by focusing on ensuring equality and developing human potential in line with the principles of UDI. The implementation of UDI in the classroom can support Sen's Capability Approach. Results indicated that UDI principles can lead to enhanced capabilities for SWVDs and can make them perform better in the classroom. A significant correlation also included a positive relationship between applying UDI principles in the classroom and the enhancement of the academic capabilities of SWVDs in the classroom. Sen's Capability Approach was thus found to be a highly applicable model for the implementation of UDI to maximise learning outcomes in the classroom as it focuses on promoting equal opportunities and equal participation in the classroom, increasing educational development and transformation, increasing autonomy and providing opportunities to achieve.

- **New Conceptual UDI Model**

The study found that each of the applied models overlapped and shared interconnected constructs that helped motivate their applicability to inform the proposed UDI model for implementation. Based on the findings of the study, a new conceptual UDI Model was developed and proposed, thus providing a satisfactory response to the sub-question above.

8.6 Addressing the Main research question

How can the Universal Design of Instruction promote epistemological access for students with visual disabilities in the classroom?

The satisfactory addressing of the sub-questions responded adequately to the main research question backed by the study's findings. The study ascertained through its findings that the university needs to explore the potential of implementing a Universal Design Model that ensures that learning and instruction are inclusive and accessible to the diverse learner in every classroom in order to increase the epistemological access and independence of all students.

8.7 Have the objectives of the study been fulfilled?

To conclude the study, it is important to evaluate if the objectives of this research have been fulfilled.

8.7.1 Objective 1: To examine the experiences of students with visual disabilities in relation to current teaching practices in the classroom.

This was established as the study made pertinent discoveries with regard to the experiences of SWVDs in coping with current teaching practices and learning in the classroom. It was confirmed through the findings that SWVDs are significantly disadvantaged in the classroom leading to a lack of engagement, non-participation and exclusion.

8.7.2 Objective 2: To determine the challenges experienced in learning for students with visual disabilities in the classroom.

This objective was achieved as various challenges emerged through the qualitative and quantitative data analysis. Findings revealed that the lack of UDI in the classroom resulted in various challenges in the classroom, which contributed to the overall negative experiences of SWVDs.

8.7.3 Objective 3: To explore the potential of UDI implementation to facilitate/maximise learning outcomes for students with visual disabilities in the classroom.

Both qualitative and quantitative findings supported UDI as an appropriate strategy to be applied in the classroom to facilitate/maximise learning outcomes for students with visual disabilities in the classroom. The study therefore affirms that UDI can facilitate/maximise learning outcomes for students with visual disabilities in the classroom and addresses the issue of inclusion, making the successful education of SWVDs a priority.

8.7.4 Objective 4: To identify factors that can influence the implementation of UDI for inclusive learning for students with visual disabilities in the classroom.

Several important factors emerged through the study's findings in conjunction with four highly ranked UDI principles (Equitable use; Flexibility in use; size and space for approach; and tolerance for error). Such factors included understanding, engagement, re-designing and re-evaluation of the environment and teaching methods in consideration of the seven principles of UDI. In applying UDI principles, one needs to be cognisant of the diversity of human abilities and conditions and stand guided by specific factors identified through the study to apply the most appropriate design within the context of the classroom.

8.7.5 Objective 5: To propose a conceptual model that can incorporate UDI to promote learning outcomes for students with visual disabilities.

This objective was accomplished. Through the study's findings, a proposed conceptual UDI model for implementation materialised, supported by the selected theoretical frameworks to promote learning outcomes for students with visual disabilities in the classroom (Refer to section 7.5 Figure 7.3). The proposed conceptual UDI model supports the Social Model of disability and will shift the focus from the student displaying the disability to the actual learning environment to enable the epistemological access of SWVDs in the classroom.

8.8 Recommendations Made by this Study

The recommendations made by the study are provided in the sections below.

8.8.1 Recommendation 1- The Consideration of Implementation of the Study's Conceptual UDI Model

The conceptual UDI model that the study proposed was found to be fitting and suitable for the classroom setting at UKZN. The UDI model based on the study's findings should motivate the university to now take the next step and evaluate this model at a strategic, managerial and ground level to determine the feasibility of implementation of such a model in the classroom.

8.8.2 Recommendation 2-UDI in the Classroom to be on the EMC Agenda

The university must become UDI-compliant, which must be driven by the Executive Management Committee (EMC) and placed on the EMC agenda. It must be driven from a top-down level, meaning from EMC down to the ground level role-players. Since the study's focus is on UDI in the classroom, it must channel down into the academics at the ground level to facilitate the implementation of UDI along with other related stakeholders. This implies that all necessary budgetary and financial resources must be made available for the university to start embracing UDI at an institutional level. The EMC must become aware of UDI and action it in the correct way. It is recommended that more awareness and recognition of UDI is required at the university in consultation with all SWDs when it comes to in classroom learning. This should include key stakeholders, such as Disability Coordinators and Specialists, to drive the awareness of UDI and in that way inform the greater university community.

8.8.3 Recommendation 3- UDI Experts/ Specialists for UDI Audit on all Classrooms and Learning Spaces

Since there are no UDI experts per se at the university to drive its implementation, it is recommended that the university bring in such specialists/experts. Universal Design of Instruction specialists should be outsourced or partnered with whether nationally or internationally to come to the university and do an audit on all academic facilities and suggest how UDI can be implemented, thus providing a clear-cut analysis of UDI and how it can be implemented in the classroom to enhance learning for SWDs/SWVDs. This can then inform resources, infrastructure and academic processes.

8.8.4 Recommendation 4- Institution of UDI Stakeholder Committee

Additionally, the formation of a University-wide UDI Stakeholder Committee can be instituted at the university involving SWDs, Deputy Vice Chancellor of Teaching and Learning, academics, Disability Support Specialists and Infrastructure personnel, amongst others. This committee should meet on a regular basis and focus primarily on making the classroom and other learning spaces UDI-compliant. Reports and feedback to EMC should be channelled via this committee.

8.8.5 Recommendation 5 – A Revised UKZN Policy on Staff and Students with Disabilities

The current University of KwaZulu-Natal policy on staff and students with disabilities is dated as it was instituted in 2004 and not revised since then. Hence the study recommends a newly revised policy be instituted clearly incorporating UDI in the classroom. Universal Design of Instruction is meant to facilitate the learning process in the classroom setting, thereby making the university accessible. This should begin at the policy level. The UKZN

policy must take into consideration all disabilities, including SWVDs, but with a focus on the inclusion of UDI in the classroom. As such, the results of the study can inform its application in a new revised UKZN policy.

8.8.6 Recommendation 6- University's Teaching and Learning Office to Proactively Provide Reformatted Academic Material

Universal Design of Instruction was found to simplify the classroom experience. The study recommends that such a system be considered for implementation to assist with the provision of accessible, assistive and reformatted academic material by the academic sector and not by conveniently referring it to the DSU. This means that appropriately reformatted academic material must be provisioned so that when students are receiving notes in the classroom, it must already be in the preferred formats catering for the needs of all visual disabilities such as Braille or large font size, to name a few. Universal Design of Instruction can become a key constituent of the university's Teaching and Learning office that will cater for the ongoing and proactive re-formatting of academic material for all formats.

8.8.7 Recommendation 7 – Involvement and Employability

The study found that students were highly motivated by staff with visual disabilities who work within the university. It was therefore recommended that the employment of SWVDs at the university be encouraged by assisting them to develop social skills and empowering them to self-advocate. The study found that this could open doors with regard to the employability of SWVDs. Universal Design of Instruction requires the empathy and involvement of designers and users of the teaching and learning environment. It was therefore recommended that preparing SWVDs for employability at the university could help with the judgements and feedback about the usability of the educational design, which could aid in the understanding of the challenges they experience.

8.9 Limitations Experienced During the Study

Limitations evolved through the study outcome as follows:

- The study was limited to respondents who chose to respond. Due to the sensitive nature of research with human subjects, not all of the sample population targeted participated in the study.
- The study was limited to one Higher Education Institution.
- The study took place during the COVID-19 pandemic under lockdown conditions and during the KwaZulu-Natal Riots (2021), which may have influenced the emotional states of participants, the researcher and the research outcomes.
- In the face of Covid-19, the researcher was compelled to apply alternative methods for data collection that were not used before. This led to unforeseen problems that arose during the data collection process, which were beyond the control of the researcher, such as the use of telephonic/electronic and cell phones to conduct interviews. This was problematic due to intermittent load-shedding and poor internet coverage and network failure.
- The sample was less than the anticipated sample population due to data collection during COVID -19 lockdown restrictions. The survey questionnaire was administered via electronic means and interviews were conducted via Zoom, telephone or other electronic platforms. This could have influenced the response rate.

8.10 Direction for Future Research

The study revealed that there were not many empirical studies to demonstrate the effectiveness of the Universal Design of Instruction concepts in the Higher Education context. The study therefore proposed the following for future research:

- I. A study can involve replicating this investigation at other South African HE institutions that evaluate Universal Design of Instruction for implementation to promote inclusivity as it is a relatively new framework and there are minimal studies of this nature in South Africa.
- II. A pre and post-evaluation of the effectiveness of UDI implementation with regards to learning outcomes and academic performance of SWVDs at a HEI. A similar study to

examine the effectiveness of UDI implementation at school level (Primary and Secondary).

- III. A study can be carried out as a mechanism to monitor and track progress towards full accessibility at the university and explore how the university can move from segregated classroom spaces to a classroom that adheres to the principles of UDI.
- IV. A study conducted at the academic and management level relating to UDI implementation at the university, thus familiarising the institution from a top-down perspective with the benefits of UDI implementation in various academic and administrative workspaces and learning environments.
- V. A similar study that focuses primarily on post-graduate students at the university to ascertain the impact of UDI on SWDs in terms of Research only.
- VI. A study to examine the principles of UDI and its impact on employees with disabilities in governmental/ public entities and the private sector.

8.11 Conclusion

This final chapter concluded the research and drew the study to a close. It summarised the research findings with regard to the research problem and confirmed that the study adroitly addressed the research questions and objectives in response to the main research question. This study aimed to examine the incorporation of the Universal Design of Instruction in the classroom within a Higher Education setting that can promote epistemological access for students with visual disabilities in the classroom and facilitate/maximise learning outcomes. The study proposed a conceptual UDI model that could be seen as a strategy to alleviate the problems and challenges currently experienced in the HE classroom. It therefore fulfilled its intended purpose and addressed the problem statement. The theoretical understanding and practical applications of the Universal Design principles were warranted through the study's findings. In relation to these findings, this chapter clearly conveyed that the demand for inclusive educational practices is increasing due to a growing population of SWVDs at the university as it tries to uphold international standards in providing quality education. Therefore, there is a need to re-conceptualise current teaching and learning practices as one knows them today. A move toward a Universal Design of Instruction of education in adherence to the Social Model will aid in accomplishing human rights obligations and contribute toward a truly inclusive educational environment. Moreover, it would position the

university at a competitive advantage with highly ranked Higher Education Institutions globally. There was also a lack of Universal Design of Instruction practices in HEIs in South Africa and other African countries. Therefore this study capitalised on this opportunity to explore its application at a South African institution. The statistical outcomes and inductive qualitative findings can be reciprocated in other institutions of Higher Education in South Africa and other African counties. The study extracted various unexplored avenues concerning prospects for Universal Design of Instruction. The study also derived specific factors that pilot its implementation and listed possible courses for future research. Recommendations that emerged from the study's findings were discussed and the limitations were documented.

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Appendix 1- Ethical Clearance



03 April 2020

Mrs Jayshree Singh (209538421)
School of Education
Edgewood Campus

Dear Mrs Singh,

Protocol reference number : HSSREC/00000872/2019

Project title: Promoting inclusive learning through Universal Design Instruction (UDI): Exploring the potential of UDI to enhance learning for Students with Visual disabilities in the classroom

Degree : PhD

Approval Notification – Full Committee Reviewed Application

This letter serves to notify you that your response received on 03 February 2020 to our letter of 22 January 2020 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 03 April 2021.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,



Professor Dipane J Hlalele (Chair)

/ms

Humanities & Social Sciences Research Ethics Committee
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Tel: +27 31 260 8350 / 4557 / 3587
Website: <http://research.ukzn.ac.za/Research-Ethics/>

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

INSPIRING GREATNESS

Appendix 2- Informed Consent Letter

“UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL

For research with human participants

INFORMED CONSENT

Information Sheet and Consent to Participate in Research”

“Date: 02 July 2019

Dear Prospective Respondents

My name is Jayshree Singh from Kwazulu-Natal, PHD student, in the School of Applied Human Sciences at the College of Humanities, at the UKZN. [REDACTED]

[REDACTED] greatwhitesac@gmail.com)

Supervisor: Dr Sachin Suknunan (031 260 7057; suknunan@ukzn.ac.za)

I am conducting a research project for my Doctoral Degree. The title of my work is:”“

“Promoting inclusive learning through Universal Design Instruction (UDI): Exploring the potential of UDI to enhance learning for students with visual disabilities in the classroom”

You are being invited to consider participating in a study that motivates for the incorporation of a universal design curriculum to promote the epistemological access to learning for students with visual disabilities (SWVDs). Exploring UDI for implementation provides an important opportunity to advance the understanding of problems and challenges in relation to knowledge delivery and learning as”“research has consistently shown that SWDs lack adequate interventions to ameliorate their full participation within the HEIs. This study could afford you an opportunity to participate in an intervention strategy that will explore new avenues towards providing the most suitable foundation for embracing transformation toward greater accessibility and more opportunities for students with visual disabilities at a prominent institution of Higher Education such as the

UKZN. The aim of this research is to examine strategies to incorporate universal design for instruction into the current university system. As a result the study provides an important opportunity to advance the understanding of inclusive education. The purpose of the study is to determine how a UDI can promote epistemological access for students with visual disabilities at UKZN. The study may also include tracing the lived epistemological experiences of students with visual disabilities through the various curricula on offer at UKZN. The study further intends to conceptualise a predictive UDI model backed by lived experiences of students with visual disabilities.”

“The study applies a mixed methods approach that uses a combination of quantitative and qualitative research methods. The study outcomes will be predicated on and will rely on SWVDs across UKZN to become the primary motive for transformation. The quantitative component will involve all students with visual disabilities across the university. Therefore a census approach will be adopted to extract information targeting all students (204) with visual disabilities.

Convenience sampling techniques will be applied. The qualitative component will comprise of in-depth interviews of at least 10 to 15 students with visual disabilities (to trace their lived experiences of epistemological access of the curriculum) across all 4 campuses. If you agree to participate, it will involve the following procedure: Appointments will be made for each interview. I will interview you once or twice during the second semester of 2019 at a time and place that is convenient for you. The interviews will accommodate the needs of SWVDS therefore the duration will be dependent on individual capacity (30-35 minutes), and will be tape recorded. Interview schedules will be used as data collection instruments.”

“The administration of questionnaires will include all students with visual disabilities and will be made available in appropriate formats consistent with their visual disability (such as Screen reading Software (JAWS), Braille print for SWVDs, enlarged font size for students who are partially sighted and have low vision). The questionnaire will take approximately 25 to 30 minutes to complete allowing extra time allocation where applicable to compensate for the needs of SWVDs. An online tool will also be used to facilitate the distribution of the survey to a large audience of students with disabilities. In total the study strives to achieve approximately 204 participants in a two-part process using surveys and interviews at the UKZN.”

“study involves no risks or discomforts. The study will provide no direct benefits to participants however you will be participating in a research study that is unique at UKZN where it introduces a new paradigm towards transformation and greater inclusivity for SWDs through universalism.

However, pre or post interview/survey, should you require any further psychosocial support you may contact:

1. Primary: Disability Support Unit on your respective Campus
2. Secondary: College based Student support Centres related to your College

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number:HSSREC/00000872/2019).

In the event of any problems or concerns/questions you may contact me (the researcher) or my supervisor Dr. Suknunan using the above stated contact details or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building”

“Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Participation in this research is voluntary and you may refuse to participate or withdraw from the project at any time with no negative consequences. In the event of refusal/withdrawal of participation you will not incur penalty or loss of treatment or other benefit to which you are normally entitled.

Your anonymity will be maintained by not identifying you in the thesis or in the dissemination of the research findings. Confidentiality of records identifying you as a participant will be maintained by the School for a period of five years, after which such documents will be disposed of in accordance with Ethical Committee instructions.”

“CONSENT

I _____, have been informed about the study entitled Universal Design Instruction at an Institution of Higher Education: To promote equal access in teaching and learning for students with visual disabilities by Jayshree Singh.

I understand the purpose and procedures of the study.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.”

“If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at (details provided above).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za”

“Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion YES / NO

Signature of Participant

Date

Signature of Witness
(Where applicable)

Date

Signature of Translator
(Where applicable)”

Date

Appendix 3– Questionnaire



“COLLEGE OF HUMANITIES: PHD RESEARCH QUESTIONNAIRE

Survey Questionnaire (Quantitative)

Participants: students with visual disabilities(SWVDs)

A. Opening

My name is Jayshree Singh from Kwazulu-Natal, PHD student, in the School of Education at the College of Humanities, at the UKZN.

I am conducting a research project for my PHD and the title of my work is:

Promoting inclusive learning through Universal Design of Instruction (UDI): Exploring the potential of UDI to enhance learning for Students with Visual disabilities in the classroom

“B. (Purpose)

Thank you for agreeing to participate in this study your role in the study involves completing one questionnaire which enquires about all the constructs explained earlier. I would like to ask you some questions about your background, your education and some experiences you have had at a mainstream university in order to learn more about you. It will be very helpful to learn from you about what may help to make a course more accessible for students with visual disabilities. I’m going to ask you a few questions about your needs and preferences with respect to the way that courses are currently designed. There are no any right or wrong answers. I want you to feel comfortable to relate your experiences and opinions. You are free to decline to answer any questions if you choose and if you wish to stop the interview at any time, simply let me know. “

“C. (Motivation)

This interview is related to enhancing learning outcomes for Students with visual disabilities. Firstly I would like to explain to you how the study proposes to enhance educational access for students with visual disabilities. To help the University become more inclusive this study embraces the principles of UDI. The principles of UDI makes learning accessible to all students where course content is accessible and the potential to perceive and understand the content is equally understood by all. For instance, if information is posted on the student learning system or the Moodle site, all students should be able to find and open or download the content, and also use the content (e.g., by reading or listening to it). It should also be possible for all students to have the ability to express their understanding of the content, and therefore course assignments should also be accessible to all students. In general, accessible courses tend to be flexible based on UDI principles.

I hope to use the information you provide to motivate for the implementation of UDI principles to enhance educational access for students with visual disabilities to help the University become more inclusive:”

“

Principles	Application
1. Equitable use	The design must be usable to SWDs.
2. Flexibility in use	The design should accommodate a wide range of individual preferences and abilities.
3. Simple and intuitive use	The design must be user friendly regardless of the user’s experience, knowledge or language skills.
4. Perceptible information	The design communicates necessary information effectively to the user, regardless of abilities.
5. Tolerance for error	The design caters for and minimises the adverse consequences of accidental or unintended actions.
6. Low physical effort	The design can be used efficiently and comfortably and without strain.
7. Size and space for approach and use	The design must allow use regardless of the person’s body size, posture, or mobility.

Table 1. The Principles of Universal Design”

D. (Time Line)

The survey will be approximately 25-30 minutes long. Please take your time to understand the questions and make the appropriate choices by adding a tick (✓) where applicable next to the answer of your choice.

Biographical Information of the Participant

General Biographical/demographic information

1. Gender :

1 2

M		F	
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2. What is your age?

1 2 3 4

18-21		22-25		26-30		30- older
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3. What is the nature of your visual disability (for the researcher's knowledge)?

4. Which college are you registered at?

5. What campus are you currently based at?

6. What is your current year of study?

7. Race

- ☐ African¹
- ☐ Indian²
- ☐ Coloured³
- ☐ White⁴

Universal Design for Learning Student Survey”

“The purpose of this survey is to help your lecturers/instructors and other members of the UKZN community understand their impact on your learning. Please take time to fill out the survey to help us in exploring the potential of UDI to enhance learning for students with visual disabilities in the classroom.

1. What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?

1.1 How familiar are you with Universal Design Instruction (UDI)?

Never heard of it		Not familiar		Somewhat Familiar		Familiar	
-------------------	--	--------------	--	-------------------	--	----------	--

1.2 Note the 7 principles of UDI tabulated below and rate the extent to which each principle was met as a SWVD in your class, using the following scale:

1 = greatly met→5 = not at all

1. The provision of materials that are adaptable to the needs of SWVDs	
2. The provision of sources of information that is easy to use and accommodate a wide range of individual preferences and abilities.	
3. The course design is user friendly regardless of the user's experience, knowledge or language skills and communicates material easily and effectively	
4. The design communicates necessary information effectively to the user, regardless of abilities	
5. The design caters for and minimises the adverse consequences of accidental or unintended actions and allows me to make mistakes and not be penalized	
6. The design can be used efficiently and comfortably without strain.	
7. The design must allow use regardless of the person's body size, posture, or mobility and does not "singled out" or stigmatized certain students	

1.3 On a scale of (1- 10 where 1 is very poor/non-compliance and 10 is extremely compliant) how would you rate UKZN's compliance to the principles of UDI in your classroom environment.

1		2		3		4		5		6		7		8		9		10	
---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	---	--	----	--

1.4 Describe your current learning experiences in the classroom?

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
The lecturer/instructor appropriately engages in learning content with SWVDs					
Essential learning/reading materials are available to you in alternate formats?					
Essential lecture content/information provided during lectures is presented in multiple					

formatsto accommodate your disability.					
Assignments accommodate for different formats relevant to SWVD					
Tests and examsallow you to express your comprehension in alternative ways respective to SWVD.					

1.5 Although learning happens in the classroom between the lecturer and the student learning also happens between students in the classroom. When working on group assignments and exercises in the classroom:”

“

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1.5.1 I feel that my contribution is valued?					
1.5.2 I always engage with the group					
1.5.3 I feel like I don't belong					
1.5.4 Other students are taking my contributions into consideration for the class project?					

2. What are the current challenges in learning for students with visual disabilities in the classroom?

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
As a SWVD, I find that:					
2.1 It is difficult to engage with Lecture content in class					
2.2 It is difficult to properly engage with instructor in class					
2.3 The class climate is not conducive to SWVD					
2.4 There is no alternative formats for lecture content					
2.5 I don't feel motivated to learn in the classroom					
2.6 The instructor does not understand how to relate to SWVD					
2.7 We are forced to learn like able-bodied					

students					
2.8 The environment allows for orientation and mobility					
2.9 It is easy to adapt to the support currently provided for SWVDs					

3. How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?

3. Universal Design Instruction can maximise learning outcomes for me as a SWVD in the following ways:

Principles of Universal Design	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
3.1 I will be able to learn better in the classroom as the instructor creates a class climate in which student diversity is respected.					
3.2 My performance in test and exams can increase					
3.3 Engagement with lecture content will improve as UDI will offer formats in real-time					
3.4 It will not require as much effort to learn as UDI embraces technology to enhance my learning in the classroom					
3.5 Uses technology to facilitate communication between SWVDs and the instructor and other students.					
3.6 Assistive technology, allows SWVDs to work at their own pace independently					
3.7 Technology provides the right device, training and time to improve learning					
3.8 I am adequately accommodated according to my abilities to engage with the course content					
3.9 I can easily communicate with the instructor about possible difficulties exclusive to my abilities					
3.10 UDI will offer me alternate means to access my learning needs in the classroom					
3.11 UDI will reasonably accommodate my learning (time)					
3.12 UDI provides access to learning in living spaces appropriate to my individual					

needs					
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4. What factors must be considered for implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom?

4. What factors should UKZN consider for UDI Implementation in the classroom for SWVDs:

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
4.1 Engagement with SWVD to assess needs					
4.2 University wide awareness to all stakeholders					
4.3 Redesigning of Lecture rooms according to UDI principles					
4.4 Re-evaluation of courses in consideration to UDI					
4.5 Physical accessibility within the classroom					
4.6 Alternative Format (Braille)					
4.7 Computer adaptive software (Screen reading software like JAWS)					
4.8 The availability of lecture notes online for SWVD					
4.9 An Institutional understanding of UDI					

5. Models used to conceptualise the incorporation of UDI to promote learning outcomes for students with visual disabilities.

5. Maslow's Hierarchy of Needs

5.1 The implementation of UDI in the classroom can	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
5.1.1 Allow for more greater academic achievement (performance in assessments, tests and exams)					
5.1.2 Result in personal confidence and enhanced					

learning outcomes					
5.1.3 Fulfil esteem needs and promote fulfilment of learning objectives in the classroom.					
5.1.4 Promote a sense of belonging in the classroom.					
5.1.5 Provides equal opportunity by communicating information effectively to SWVDs					
5.1.6 Promote equal participation in the classroom through accommodative design					
5.2 UDI can enhance learning outcomes in the classroom by:	Strongly Agree	Agree		Disagree	Strongly Disagree
5.2.1 Promoting engagement through communicating necessary information effectively to SWVDs in the classroom.					
5.2.2 Providing quality education by utilising user friendly methods of presentation of coursework relevant to SWVDs					
5.2.3 Will promote independence in functioning by providing course content and assessment methods that satisfies a wide range of individual preferences and abilities of SWVDs in the classroom.					
5.2.4 Providing SWVDs a sense of autonomy by providing course content and assessment methods regardless of the type of visual impairment, body size, posture, or mobility.					

6. Social Model of Disability

The implementation of UDI in the classroom can:	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
6.2 Lead to a change in attitude amongst instructors and students					
6.3 Improve the interaction between SWVDs with lecturers and other students in the classroom					

6.4 Improve social circumstances such as isolation, stigmatisation, discrimination, stereotyping and myths about disability in the classroom.					
6.4.1 Promote Educational equity					
6.4.2 Promote Inclusive education					

7. Systems Theory

Statements	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
7.1 The application of the principles of UDI can foster good relationships between SWVDs, lecturer and other students in the classroom by					
7.1.1 Encouraging engagement					
7.1.2 Disability awareness					
7.1.3 Re-evaluation of courses					
7.1.4 Physical accessibility in the classroom					
7.2 To enhance learning outcomes in the classroom for SWVDs requires reciprocity (give-and-take actions) that includes Disability coordinator, lecturer, and other students.					
7.3 The application of UDI in the classroom will maximise learning outcome for SWVDs holistically and provide:					
7.3.1 Working collaboratively in a system within the classroom.					
7.3.2 Students with visual disabilities will feel a connectedness to all aspects of learning in the classroom.					
7.4 Challenges should be addresses by all stakeholder at the university by promoting shared					

responsibility through:					
7.4.1 Social interaction of SWVD, lecturers and other students in the classroom					
7.4.2 Participation of SWVDs in all aspects of learning in the classroom.					

8. Sen's Capability Approach

Statements					
8.1 Adopting the principles of UDI in the classroom will improve functioning-expanding capabilities through :	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
8.1.1 Academic Achievements					
8.1.2 Basic need satisfaction					
8.1.3 Dynamics of participation					
8.1.4 Human diversity					
8.2 Applying UDI will result in enhanced academic capabilities by:	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
8.2.1 Widening choices					
8.2.2 Facilitate retention and throughput					
8.2.3 Increasing autonomy					
8.2.4 Providing opportunities to achieve					
8.3 Applying UDI enhance capabilities for SWVD through:	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
8.3.1 Human development					
8.3.2 Transformation					
8.3.3 Equal opportunities					
8.3.4 Equal participation					

Closing

I appreciate the time you took to complete the survey. Is there anything else you think would be helpful for me to know so that I can successfully introduce it into the study?

I should have all the information I need. Would it be alright to call you at the Disability Office at your respective campus if I have any more questions? Thanks again. I look forward to the processing of your questionnaire to learn more about your experience.

Thank you so much for helping with this research. If you would like me to report back to you and your peers on the research, it would be a pleasure for me to do so. There is no charge for a research report back.

Thank you.

The End

Appendix 4- Interview Schedule



“COLLEGE OF HUMANITIES: PHD RESEARCH INTERVIEW SCHEDULE

Interview Schedule (Qualitative)

Participants: Students with visual disabilities (SWVDs)

A. Opening

My name is Jayshree Singh from Kwazulu-Natal, PHD student, in the School of Education at the College of Humanities, at the UKZN.

I am conducting a research project for my PHD and the title of my work is:”

Promoting inclusive learning through Universal Design Instruction (UDI): Exploring the potential of UDI to enhance learning for Students with Visual disabilities in the classroom

“

B. (Purpose)

Thank you for agreeing to be interviewed for this study. I would like to ask you some questions about your background, your education, and some experiences you have had at a mainstream university in order to learn more about you. It will be very helpful to learn from you about what may help to make a course more accessible for students with visual disabilities. I’m going to ask you a few questions about your needs and preferences with respect to the way that courses are currently designed. There aren’t any right or wrong answers. I want you to feel comfortable to relate your experiences and opinions. You are free to decline to answer any questions if you choose, and if you wish to stop the interview at any time, simply let me know.

C. (Motivation)

This interview is related to enhancing learning outcomes for students with visual disabilities. Firstly I would like to explain to you how the study proposes to enhance educational access for students with visual disabilities. To help the University become more inclusive this study embraces the principles of UDI. The principles of UDI makes learning accessible to all students where course content is accessible and the potential to perceive and understand the content is equally understood by all. For instance, if information is posted on the student learning system or the “Moodle” site, all students should be able to find and open or download the content, and also use the content (e.g., by reading or listening to it). It should also be possible for all students to have the ability to express their understanding of the content, and therefore course assignments should also be accessible to all students. In general, accessible courses tend to be flexible based on UDI principles.

I hope to use the information you provide to motivate for the implementation of UDI principles to enhance educational access for students with visual disabilities to help the University become more inclusive:”

“

Principles	Application
1. Equitable use	The design must be usable to SWDs.
2. Flexibility in use	The design should accommodate a wide range of individual preferences and abilities.
3. Simple and intuitive use	The design must be user friendly regardless of the user’s experience, knowledge or language skills.
4. Perceptible information	The design communicates necessary information effectively to the user, regardless of abilities.
5. Tolerance for error	The design caters for and minimises the adverse consequences of accidental or unintended actions.
6. Low physical effort	The design can be used efficiently and comfortably and without strain.
7. Size and space for approach and use	The design must allow use regardless of the person’s body size, posture, or mobility.

Table 1. The Principles of Universal Design

D. (Time Line)

The interview will be approximately 25-30 minutes long. Are you available to respond to some questions at this time? Let me begin by asking you some questions about you.”

“

Biographical Information of the Participant
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A. General Biographical/demographic information

8. Gender :

M		F	
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9. What is your age?

18-21		22-30		30- older	
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10. What is the nature of your visual disability (for the researcher's knowledge)?

11. Are you aware of your level of visual impairment? In order to request

accommodations you as a SWVDs need to know your visual status in terms of

- Diagnosis (level of visual impairment)
- Prognosis (Is your visual impairment likely to change (improve or deteriorate over time or will you require more advanced accommodations to facilitate learning)?
- Is your visual impairment likely to remain the same for the duration of the study?

12. Which college are you registered at

13. What campus are you currently based at?

14. What is your current year of study?

15. What qualification are you registered for?

In order to request accommodations you will need to know your visual status in terms of:

- Diagnosis – level of visual impairment (qualitative)
- Prognosis –
 - a. Is your visual impairment likely to change (improve or deteriorate)? Over time will you require more advanced accommodations to facilitate learning?
 - b. Is your visual impairment likely to remain the same for the duration of the study?

16. Are you as SWVDs aware of your level of visual impairment?

B. The study attempts to provide answers to the following research questions:

- How can a universal design instruction promote the epistemological access for students with visual disabilities in the classroom?
- What type of model can be conceptualised to incorporate UDI to promote learning outcomes for students with visual disabilities?”

Research Sub-question 1

1. What are the experiences of students with visual disabilities in coping with current teaching practices in the classroom?

1. Do you feel UKZN is UDI compliant? Explain your answer.
2. Please discuss your current experiences in the classroom?

Possible follow-up questions on answers to the primary question:

- How are you currently coping in the classroom with your visual disability?
- What was the most positive experience as a SWVD at UKZN?
- What are some of your most negative experiences as a SWVD at UKZN?
- What are your suggestions to the university to improve their services to help students with disabilities overcome existing learning barriers?

Research Sub-question 2

2. What are the current challenges in learning in the classroom for students with visual disabilities in the classroom?

1. Describe some of your personal challenges that you experience in the classroom.

Possible follow-up questions on answers to the primary question:

- What are the problems/limitations/difficulties you encounter in your learning activities?
- What is lacking in your current set-up in the classroom?
- How has this impacted on your studies?
- What other services should be provided that would help you with your studies?

Research Sub-question 3

3. How can the implementation of UDI facilitate/maximise learning outcomes for students with visual disabilities in the classroom?

1. Are you familiar with the UDI principles? Let me explain the principles of UDI to you to give you some insight (see C above).

Possible follow-up questions on answers to the primary question:

- Based on your experience are the 7 principles of UDI taken into account at the university?
- Do you feel if the principles of UDI were incorporated it would enhance learning in the classroom?
- If yes, how will it enhance your learning experience in terms of the UDI principles as follows :”

“Principles of Universal Design

1. The provision of materials that are adaptable to the needs of SWVDs	
2. The provision of sources of information that is easy to use and accommodate a wide range of individual preferences and abilities.	
3. The course design is user friendly regardless of the user’s experience, knowledge or language skills and communicates material easily and effectively	
4. The design communicates necessary information effectively to the user, regardless of abilities	
5. The design caters for and minimises the adverse consequences of accidental or unintended actions and allows me to make mistakes and not be penalized	
6. The design can be used efficiently and comfortably and without strain.	
7. The design must allow use regardless of the person’s body size, posture, or mobility and does not “singled out” or stigmatized certain students	

Research Sub-question 4

4. What factors must be considered for implementation of UDI to promote inclusive learning for students with visual disabilities in the classroom?

4. In your understanding of UDI how will it advance learning in the classroom for students with your type of visual disability?

Possible follow-up questions on answers to the primary question:

- In your capacity as a student do you think it is possible for the principles of UDI to be implemented at the university?
- Do you feel that the university should consider implementing UDI principles in its course design?
- What important aspects or factors should be considered in implementing a more accessible (flexible) course design that would benefit your learning?
 - Equitable use
 - Flexibility in use
 - Simple and intuitive use
 - Perceptible information
 - Tolerance for error
 - Low physical effort
 - Size and space for approach and use”

The Theoretical frameworks

5. In terms of the 4 models that will be applied in the study do you feel the principles of UDI can advance learning outcomes for students with visual disabilities?

- Do you feel that the 7 principles of UDI will afford you the ability to feel a sense of belongingness and achievement?
- How should the university change its perceptions to incorporate UDI?
- Do you feel working collaboratively as a system will enhance learning for SWVDs?
- How will UDI enhance capabilities in the classroom?

Although learning happens in the classroom between the lecturer and the student learning also happens between students in the classroom.

- When working on group assignments and exercises in the classroom:
 - Do you feel that your contribution is valued?
 - What are your expectations in a group?
 - Do you engage with the group or do you feel like you don't belong
 - Are other students taking your contributions into consideration for the class project?

Well, it has been a pleasure finding out more about you and your experience as a student with your type of visual disability in the classrooms within UKZN.

Closing

I appreciate the time you took for this interview. Is there anything else you think would be helpful for me to know so that I can successfully introduce it into the study?"

"I should have all the information I need. Would it be alright to call you at the Disability Office at your respective campus if I have any more questions? Thanks again. I look forward to the processing of your interview to learn more about your experience.

Thank you so much for helping with this research. If you would like me to report back to you and your peers on the research, it would be a pleasure for me to do so. There is no charge for a research report back.

Thank you.

The End

Appendix 5- Gatekeeper's Letters



13 September 2019

Mrs Jayshree Singh (SN 209538421)
School of Education
College of Humanities
Edgewood Campus
UKZN
Email: greatwhitesac@gmail.com

Dear Mrs Singh

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN) towards your postgraduate studies, provided Ethical clearance has been obtained. We note the title of your research project is:

"Promoting inclusive learning through Universal Design Instruction (UDI): Exploring the potential of UDI to enhance learning for Students with Visual Disabilities in the classroom."

It is noted that you will be constituting your sample by handing out questionnaires, conducting interviews and/or focus group discussions with students with visual disabilities at UKZN.

Please ensure that the following appears on your notice/questionnaire:

- Ethical clearance number;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

You are not authorized to contact staff and students using 'Microsoft Outlook' address book. Identity numbers and email addresses of individuals are not a matter of public record and are protected according to Section 14 of the South African Constitution, as well as the Protection of Public Information Act. For the release of such information over to yourself for research purposes, the University of KwaZulu-Natal will need express consent from the relevant data subjects. Data collected must be treated with due confidentiality and anonymity.

Yours sincerely

DR KE CLELAND
REGISTRAR (ACTING)

Office of the Registrar

Postal Address: Private Bag X54001, Durban, South Africa

Telephone: +27 (0) 31 260 8005/2206 Facsimile: +27 (0) 31 260 7824/2204 Email: registrar@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix 6- Statistical Data

			Correlations																
			7 Principles of UDI	UKZN's compliance to the principles of UDI	Current Learning Experiences in The Classroom	Group Assignments and Exercises in The Classroom	Current Challenges in Learning for students with visual disabilities	Implementation of UDI Facilitate/ Maximise Learning Outcomes	Factors to be Considered for Implementation of UDI to Promote Inclusive Learning	Implementation of UDI in the Classroom	UDI can Enhance Learning Outcomes in the Classroom	Implementation of UDI in the Classroom (2)	Application of the Principles of UDI can Foster Good Relationships	Reciprocity	Application of UDI in the Classroom will Maximise Learning Outcome	Challenges Should be Addressed by all Stakeholder at the University	Adopting the Principles of UDI in the Classroom	Applying UDI will Result in Enhanced Academic Capabilities	Applying UDI Enhance Capabilities for SWVD
Spearman's rho	7 Principles of UDI	Correlation Coefficient	1.000																
		Sig. (2-tailed)																	
		N	21																
	UKZN's compliance to the principles of UDI	Correlation Coefficient	.563**	1.000															
		Sig. (2-tailed)	0.008																
		N	21	21															
	Current Learning Experiences in The Classroom	Correlation Coefficient	.571**	.447*	1.000														
		Sig. (2-tailed)	0.007	0.042															
		N	21	21	21														
	Group Assignments and Exercises in The Classroom	Correlation Coefficient	0.163	-.004	-.066	1.000													
		Sig. (2-tailed)	0.481	0.986	0.776														
		N	21	21	21	21													
	Current Challenges in Learning for students	Correlation Coefficient	-.694**	-.435*	-.692**	-.129	1.000												
		Sig. (2-tailed)	0.00	0.04	0.001	0.578													

	with visual disabilities		0	9														
		N	21	21	21	21	21											
	Implement ation of UDI Facilitate/ Maximise Learning Outcomes	Correlation Coefficient	- 0.191	- 0.085	-.499*	0.261	.449*	1.000										
		Sig. (2-tailed)	0.408	0.713	0.021	0.253	0.041											
		N	21	21	21	21	21	21										
	Factors to be Considered for Implement ation of UDI to Promote Inclusive Learning	Correlation Coefficient	- 0.341	- 0.255	-.670**	- 0.199	0.391	.475*	1.000									
		Sig. (2-tailed)	0.131	0.265	0.001	0.387	0.080	0.030										
		N	21	21	21	21	21	21	21									
	Implement ation of UDI in the Classroom	Correlation Coefficient	- 0.148	- 0.045	- 0.272	0.026	0.190	.537*	0.237	1.000								
		Sig. (2-tailed)	0.522	0.846	0.232	0.912	0.408	0.012	0.301									
		N	21	21	21	21	21	21	21	21								
	UDI can Enhance Learning Outcomes in the Classroom	Correlation Coefficient	- 0.337	- 0.297	0.126	-.454*	0.195	0.035	0.075	0.229	1.000							
		Sig. (2-tailed)	0.135	0.191	0.586	0.039	0.396	0.881	0.748	0.318								
		N	21	21	21	21	21	21	21	21	21							
	Implement ation of UDI in the Classroom (2)	Correlation Coefficient	- 0.173	- 0.387	- 0.313	0.087	0.302	0.326	0.158	.573**	0.216	1.000						
		Sig. (2-tailed)	0.454	0.083	0.167	0.709	0.184	0.149	0.494	0.007	0.347							
		N	21	21	21	21	21	21	21	21	21	21						
	Application of the Principles of UDI can Foster	Correlation Coefficient	- 0.201	- 0.004	- 0.367	- 0.015	0.085	0.242	.492*	0.359	0.346	0.396	1.000					
		Sig. (2-tailed)	0.383	0.986	0.102	0.947	0.714	0.291	0.023	0.110	0.124	0.075						

	Good Relationships	N	21	21	21	21	21	21	21	21	21	21	21						
	Reciprocity	Correlation Coefficient	0.254	0.203	0.029	-0.308	0.020	0.009	-0.080	0.137	-0.284	0.371	-0.085	1.000					
		Sig. (2-tailed)	0.267	0.378	0.900	0.174	0.932	0.970	0.730	0.553	0.212	0.098	0.713						
		N	21	21	21	21	21	21	21	21	21	21	21	21					
	Application of UDI in the Classroom will Maximise Learning Outcome	Correlation Coefficient	-.465	-0.302	-0.428	0.118	0.373	.535*	0.343	.452*	0.141	.734**	.528*	0.260	1.000				
		Sig. (2-tailed)	0.034	0.184	0.053	0.610	0.095	0.012	0.128	0.040	0.543	0.000	0.014	0.255					
		N	21	21	21	21	21	21	21	21	21	21	21	21	21				
	Challenges Should be Addressed by all Stakeholder at the University	Correlation Coefficient	-.449	-0.127	-0.225	-0.211	0.164	0.049	0.146	.529*	0.240	0.347	0.229	0.047	0.366	1.000			
		Sig. (2-tailed)	0.041	0.582	0.326	0.359	0.478	0.833	0.527	0.014	0.295	0.123	0.318	0.839	0.103				
		N	21	21	21	21	21	21	21	21	21	21	21	21	21	21			
	Adopting the Principles of UDI in the Classroom	Correlation Coefficient	-0.086	-0.295	0.025	0.221	-0.115	0.309	0.155	0.039	0.377	0.360	0.363	-0.139	.498*	-0.127	1.000		
		Sig. (2-tailed)	0.712	0.194	0.914	0.335	0.621	0.174	0.502	0.866	0.092	0.109	0.106	0.548	0.022	0.583			
		N	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21		
	Applying UDI will Result in Enhanced Academic Capabilities	Correlation Coefficient	-0.262	-0.110	-0.047	0.162	0.078	0.377	0.095	.494*	0.185	.652**	0.411	0.125	.789*	.475*	0.402	1.000	
		Sig. (2-tailed)	0.251	0.636	0.840	0.483	0.735	0.092	0.682	0.023	0.422	0.001	0.064	0.589	0.000	0.030	0.071		
		N	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
	Applying UDI Enhance Capabilities for SWVD	Correlation Coefficient	-0.413	0.028	-0.183	-0.340	0.081	0.279	0.401	0.420	.564*	0.217	.646**	-0.107	.515*	.570**	0.343	.486*	1.000
		Sig. (2-tailed)	0.063	0.904	0.426	0.132	0.728	0.220	0.071	0.058	0.008	0.344	0.002	0.644	0.017	0.007	0.128	0.025	
		N	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21

	7 Principles of UDI	UKZN's compliance to the principles of UDI	Current Learning Experiences in The Classroom	Group Assignments and Exercises in The Classroom	Current Challenges in Learning for students with visual disabilities	Implementation of UDI Facilitate/ Maximise Learning Outcomes	Factors to be Considered for Implementation of UDI to Promote Inclusive Learning	Implementation of UDI in the Classroom	UDI can Enhance Learning Outcomes in the Classroom	Implementation of UDI in the Classroom (2)	Application of the Principles of UDI can Foster Good Relationships	Reciprocity	Application of UDI in the Classroom will Maximise Learning Outcome	Challenges Should be Addressed by all Stakeholder at the University	Adopting the Principles of UDI in the Classroom	Applying UDI will Result in Enhanced Academic Capabilities	Applying UDI Enhance Capabilities for SWVD		
Spearman's rho	7 Principles of UDI	Correlation Coefficient	1.000																
		Sig. (2-tailed)																	
		N	21																
	UKZN's compliance to the principles of UDI	Correlation Coefficient	.563*	1.000															
		Sig. (2-tailed)	0.008																
		N	21	21															
	Current Learning Experiences in The Classroom	Correlation Coefficient	.571*	.447*	1.000														
		Sig. (2-tailed)	0.007	0.042															
		N	21	21	21														
	Group Assignments and Exercises in The Classroom	Correlation Coefficient	0.163	-0.004	-0.066	1.000													
		Sig. (2-tailed)	0.481	0.986	0.776														
		N	21	21	21	21													
	Current Challenges in Learning for students with visual disabilities	Correlation Coefficient	-.694*	-.435*	-.692*	-0.129	1.000												
		Sig. (2-tailed)	0.000	0.049	0.001	0.578													
		N	21	21	21	21	21												
	Implementation of	Correlation Coefficient	-0.19	-0.085	-.499*	0.261	.449*	1.000											

	UDI Facilitate/ Maximise Learning Outcomes		1															
		Sig. (2-tailed)	0.408	0.713	0.021	0.253	0.041											
		N	21	21	21	21	21	21										
	Factors to be Considered for Implementation of UDI to Promote Inclusive Learning	Correlation Coefficient	-0.341	-0.255	-.670*	-0.199	0.391	.475*	1.000									
		Sig. (2-tailed)	0.131	0.265	0.001	0.387	0.080	0.030										
		N	21	21	21	21	21	21	21									
	Implementation of UDI in the Classroom	Correlation Coefficient	-0.148	-0.045	-.0272	0.026	0.190	.537*	0.237	1.000								
		Sig. (2-tailed)	0.522	0.846	0.232	0.912	0.408	0.012	0.301									
		N	21	21	21	21	21	21	21	21								
	UDI can Enhance Learning Outcomes in the Classroom	Correlation Coefficient	-0.337	-0.297	0.126	-.454*	0.195	0.035	0.075	0.229	1.000							
		Sig. (2-tailed)	0.135	0.191	0.586	0.039	0.396	0.881	0.748	0.318								
		N	21	21	21	21	21	21	21	21	21							
	Implementation of UDI in the Classroom (2)	Correlation Coefficient	-0.173	-0.387	-.0313	0.087	0.302	0.326	0.158	.573**	0.216	1.000						
		Sig. (2-tailed)	0.454	0.083	0.167	0.709	0.184	0.149	0.494	0.007	0.347							
		N	21	21	21	21	21	21	21	21	21	21						
	Application of the Principles of UDI can Foster Good Relationships	Correlation Coefficient	-0.201	-0.004	-.0367	-0.015	0.085	0.242	.492*	0.359	0.346	0.396	1.000					
		Sig. (2-tailed)	0.383	0.986	0.102	0.947	0.714	0.291	0.023	0.110	0.124	0.075						
		N	21	21	21	21	21	21	21	21	21	21	21					
	Reciprocity	Correlation Coefficient	0.254	0.203	0.029	-0.308	0.020	0.009	-.008	0.137	-.0284	0.371	-.008	1.000				

								0				5						
		Sig. (2-tailed)	0.267	0.378	0.900	0.174	0.932	0.970	0.730	0.553	0.212	0.098	0.713					
		N	21	21	21	21	21	21	21	21	21	21	21	21				
	Application of UDI in the Classroom will Maximise Learning Outcome	Correlation Coefficient	-.465*	0.302	-.0428	0.118	0.373	.535*	0.343	.452*	0.141	.734**	.528*	0.260	1.000			
		Sig. (2-tailed)	0.034	0.184	0.053	0.610	0.095	0.012	0.128	0.040	0.543	0.000	0.014	0.255				
		N	21	21	21	21	21	21	21	21	21	21	21	21	21			
	Challenges Should be Addressed by all Stakeholder at the University	Correlation Coefficient	-.449*	0.127	-.0225	-0.211	0.164	0.049	0.146	.529*	0.240	0.347	0.229	0.047	0.366	1.000		
		Sig. (2-tailed)	0.041	0.582	0.326	0.359	0.478	0.833	0.527	0.014	0.295	0.123	0.318	0.839	0.103			
		N	21	21	21	21	21	21	21	21	21	21	21	21	21	21		
	Adopting the Principles of UDI in the Classroom	Correlation Coefficient	-.086	0.295	0.025	0.221	-0.115	0.309	0.155	0.039	0.377	0.360	0.363	-.0139	.498*	-.0127	1.000	
		Sig. (2-tailed)	0.712	0.194	0.914	0.335	0.621	0.174	0.502	0.866	0.092	0.109	0.106	0.548	0.022	0.583		
		N	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
	Applying UDI will Result in Enhanced Academic Capabilities	Correlation Coefficient	-.0262	0.110	-.0047	0.162	0.078	0.377	0.095	.494*	0.185	.652**	0.411	0.125	.789**	.475*	0.402	1.000
		Sig. (2-tailed)	0.251	0.636	0.840	0.483	0.735	0.092	0.682	0.023	0.422	0.001	0.064	0.589	0.000	0.030	0.071	
		N	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
	Applying UDI Enhance Capabilities for SWVD	Correlation Coefficient	-.0413	0.028	-.0183	-0.340	0.081	0.279	0.401	0.420	.564**	0.217	.646**	-.0107	.515*	.570*	0.343	.486*
		Sig. (2-tailed)	0.063	0.904	0.426	0.132	0.728	0.220	0.071	0.058	0.008	0.344	0.002	0.644	0.017	0.007	0.128	0.025
		N	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21

Appendix 7- Turnitin Report

Promoting Inclusive Learning through Universal Design of Instruction (UDI): Exploring the Potential of UDI

ORIGINALITY REPORT

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Appendix 8-Editing Certificate

EDITING LETTER

[REDACTED]
Clare Estate

Durban

4091

25 November 2022

To: Whom it may concern

Editing of PhD thesis: Jayshree Singh

**Promoting Inclusive Learning through Universal Design of Instruction
(UDI): Exploring the Potential of UDI to Enhance Learning for Students
with Visual Disabilities in the Classroom**

This letter serves as confirmation that the aforementioned thesis has been language edited. Requisite academic writing conventions have been adhered to.

Any queries may be directed to the author of this letter.

[REDACTED]

[REDACTED]

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