



**UNIVERSITY OF
KWAZULU-NATAL**

**INYUVESI
YAKWAZULU-NATALI**

EXPLORING VISUAL IMPAIRMENT THROUGH THE BUILT ENVIRONMENT;

Towards A Skills Development Centre in Greyville, Durban

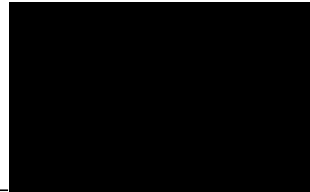
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Requirements for the degree of Master of Architecture to
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DECLARATION

I hereby declare that this dissertation is my own except where otherwise acknowledged under the supervision of Mrs Magdalena Cloete. I confirm that an external editor was not used. All citations, quotes and references have been acknowledged. It is being submitted for the partial fulfilment of the Master in Architecture degree at the University of KwaZulu-Natal. The contents of this dissertation have not been submitted previously for examination at any other University or higher education institution.



Mbuso Mancotywa

15 January 2023

Date



Magdalena Cloeta

Date

DEDICATION

Firstly, I would like to dedicate this dissertation to my Lord and Saviour, Jesus Christ. Without the strength, power and provision that he gave me, I would not have been able to complete this dissertation, and I give all the glory to him for this accomplishment obtained through his grace.

Furthermore, I would like to dedicate this dissertation to my parents, who have supported me throughout my life and academic journey. I would also like to dedicate this dissertation to my family members and other relatives who have contributed to and assisted me at various parts of my academic journey.

Last but not least, I would like to dedicate this dissertation to my partner Rita. Without your daily support, encouragement and love, I would not have had the discipline I have had throughout my post-graduate academic journey. Thank you for always showing up for me and for the massive contribution that you have made to my life, babe.

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ABSTRACT

Visual impairment can present itself as a tough challenge in a human's life, and navigating the built environment independently is often one of the biggest obstacles to be approached. Not being able to perceive the environment around one and having an absence of a strong relationship or bond to the spaces one encounters leads to visually impaired people feeling lost in space. These issues get exacerbated by the gross insufficiencies of the built environment in its response to being inclusive for the visually impaired. This is often caused by the modern architectural approach, which did not factor in significant consideration for the other senses within their designs and favoured an ocular-centric approach that gave much preference to the sense of sight in architecture. As a result of the isolation in space, visually impaired people end up being excluded from the built environment and even other activities that may take place within buildings due to the lack of inclusivity within many different architectural typologies.

This dissertation will explore how the built environment can respond more to visual impairment. The framework of the research will be formulated through the literature covering the theories of Phenomenology, Place theory, Universal Design and Multi-sensory design. These theories will more profoundly explore the human senses' role in the perception of the built environment. Understanding how architecture can respond will assist in making the built environment more inclusive for the visually impaired and strengthen the relationship of the senses to space to make architectural design more meaningful.

ABBREVIATIONS:

DHET – Department of Higher Education and Training

KZN = Kwa-Zulu Natal

KZN-SB = KZN Society for the Blind

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CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION

1.1.1 BACKGROUND

According to research by Stats SA, close to 9.2% of the South African population are living with visual impairment(Stats SA, 2016). This amounts to about 5,6 million of the population with varying eyesight problems, which means they struggle to experience the visual qualities of architecture like many others who do not have eyesight issues. Furthermore, 0,75% of the population have severe visual impairments culminating in the complete and permanent loss of visual sight. This percentage equates to approximately 454 500 citizens nationwide (Stats SA, 2022) and 23 250 within the City of Durban (Statistics South Africa, 2022).. The trends in medical research also show that even those who are not born with visual impairments or struggle with it during their formative years can experience deterioration of their sense of sight as they grow older(Stats SA, 2011) and ultimately face the challenge of never seeing a building again in their life.

Whilst there has been much progress in looking at how architecture can cater to people living with physical disabilities such as visual impairment, there still lies much-uncovered territory in inclusive designing for them in a manner that speaks to the other non-visual senses as much as the visual.

Coming from the Modernism and Post-modern approaches to architectural design in the past century, many buildings built in colonial cities such as Durban have lacked a sense of place for the local users. This has been in the realm of what is seen and the unseen, which has focused on enabling those that can see against those that are unable to see, thus creating a sense of placelessness and vulnerability for the visually impaired. According to research, visual impairment was the highest documented of all disabilities sitting at 32%, of which about 97% of those with visual disabilities are unemployed (Life Healthcare Group, 2018).

1.1.2 MOTIVATION:

The built environment needs to transform to be more inclusive to people with visual disabilities so that they are not economically excluded from opportunities. The United Nations established the Sustainable Development Goals in 2015 to end poverty, protect the planet, and promote social cohesion by 2030 (United Nations, 2015). Goals 1 and 5, respectively, address no poverty and equality, two themes this research would seek to address and explore multi-sensory design in workspaces for visually impaired people.

Many of the City of Durban buildings were established during the Modernist era. They implemented their design principles which had neglected creating place, although many of the buildings in the city generally follow suit. Most designs focused on ocular-centric minimalistic design tools and often neglected how place can be created through the non-visual senses.

1.2 DEFINITION OF THE PROBLEM, AIMS & OBJECTIVES

1.2.1 DEFINITION OF THE PROBLEM STATEMENT:

From the period after the conclusion of World War 2 (in 1945), the consciousness of the need for accessibility in the built environment for people with disabilities began. The United Nations helped accelerate progression by establishing a declaration for disabled people's rights in 1948 through the United Nations General Assembly (Evcil, 2012). In the architectural field so far, this has primarily been looking at designing buildings that are more accessible to users with disabilities. Whilst accessibility is essential, it only primarily speaks to movement and visual arrival in a space. Juhani Pallasma, who wrote *Eyes of the Skin* said,

"The elements of architecture are not visual units or gestalt; they are encounters, confrontations that interact with memory" (Pallasma, 2005: 67).

This alluded to the fact that architecture cannot be condensed into the visual experience but rather should be felt even in the other senses of the human body such as the haptic experience.

This research will explore how architectural design could be more inclusive to visually impaired users, thus enabling safer sensually stimulative spaces. There currently exists a knowledge gap within architecture about how inclusive design for visually impaired users can become a catalyst for social cohesion and integration of more blind people in the economic arena. It will explore how architecture can be able to allow for a better orientational experience within spaces. This would contribute to a more humane design that caters to more groups in society.

1.2.2 AIM

- This research will explore how built form and architecture can be more responsive to visually impaired people needing skills development facilities and how visually impaired people relate to place.

1.2.3 OBJECTIVES

- To explore the relationship between visual impairment and spatial perception (#1)
- To explore the role that memory plays in spatial perception and wayfinding (#2)

- To consider how the spatial character can be experienced through the non-visual senses (#3)
- To analyse the effects that the built environment has on the human senses (#4)
- To explore the possibilities of multi-sensory design and define principles for a skills development center (#5)

1.3 SETTING OUT THE SCOPE

1.3.1 DELIMITING OF THE RESEARCH PROBLEM

This research will explore how spaces can be experienced beyond the visual-centric and investigate how design can stimulate and cater to visually impaired people's alternative senses, such as the sense of touch and audio, two of the strongest alternative senses for engaging spatial quality and orientation. (PLOS ONE, 2017) This research will not explore each of the five human senses and how they can be designed for, nor will it look at other disabilities other than that of visually impaired people.

1.3.2 DEFINING OF TERMS

Accessibility – The ability to enter an entity to benefit from it.

Exploration - An examination of an unfamiliar area

Genius Loci – The spirit and energy of a place

Gestalt – Something made up of more than the sum of its parts.

Inclusivity – providing equal access to resources to those that ordinarily are marginalised

Multi-Sensory – A stimulation of more than one physical sense

Place – A space demarcated for use by someone

Visual Impaired – People with partial loss of clear eyesight

Vulnerable – A person in need of special care due to a disability

1.3.3 STATING THE ASSUMPTIONS

The sensory stimulative design could aid those with a visual disability to navigate around spaces more efficiently when the other senses are stimulated.

Loss of visual sense can make it difficult for people to experience the atmosphere and aura that spaces carry and instead move through placeless architecture.

Enabling visually impaired people to navigate space easier would help them be more independent in navigating around the built environment and bridge the gap between them and those who can see.

A more inclusive design approach could make integrating blind people into the South African economic arena easier, thus decreasing unemployment.

1.3.4 KEY QUESTIONS

Primary Question:

- How can the Built environment respond to visually impaired people in need of skills development facilities?

Secondary Questions:

- What is the relationship between visual impairment and spatial perception?
- What is the role of memory in spatial perception and wayfinding?
- How can spatial character be experienced through the non-visual senses?
- What are the effects that the built environment has on the human sensual experience?
- What architectural design principles can inform a multi-sensory design approach suitable for the visually impaired in the context of a skills development centre?

1.3.5 HYPOTHESIS

Transitioning from possessing the sense of sight to no longer being able to see clearly is a challenging position for any person and not being able to orientate oneself also presents further challenges of making people feel vulnerable within space. The Built environment needs to be able to design more meaningful spaces that enhance the quality of place and allow all users to interact within spaces, especially those that cater to the rehabilitation of people who have lost their visual senses. This form of inclusivity will allow for more independence in navigating any space within the public.

1.4 CONCEPTUAL/THEORETICAL FRAMEWORK

- Phenomenology
- Place Theory
- Gestalt

When looking at achieving the objectives of place being created beyond the visual sense and investigating the relationship between visual impairment and spatial perception, various theories can help shape a response. The challenge of disconnection from an ocular-centric dominant approach to design has created a built environment and spaces in which it can be difficult to orientate oneself and become placeless without the sense of sight. Looking at how built form can respond through how it creates an experience of place is essential in response to visual impairment. The scholarly works in phenomenology, place theory, and gestalt theories will form the backbone of this research as it investigates how a relevant response can be formed. The theories will each assist in developing a multi-sensory approach that doesn't neglect the need of place and strengthen the relationship between the built environment and alternate senses to sight.

1.4.1 PHENOMENOLOGY

One of the most challenging adjustments that must be made toward an inclusive design method for visually impaired people is to look at how the built form is experienced. Being able to engage with the context where we are positioned is something that not only enables one to navigate the surrounding environment easily but also be able to experience the quality of space. Looking at this challenge, the theory of Phenomenology, which deals with how people interpret the space they are within, becomes a critical theory that shapes a response. According to Christian Norberg-Schulz, space is not only made up of the visible and tangible, but it possesses other unseen qualities hidden within it. (Norberg-Schulz: 1979) Drawing attention to these unseen qualities to strengthen the relationship with the other senses improves the quality of experience within space.

One of the problems that the Modernist approach had in many parts of Durban, including Umbilo, was how abstracted the aesthetic quality of place became, resulting in the unseen qualities being overlooked and unrelatable spaces. In contrast, to such movements and approaches, the emotional and invisible side of what the architecture evokes is just as important as the material part. When looking at a multi-sensorial approach towards a Skills Development Centre and investigating the relationship between visual impairment and spatial perception,

highlighting the parts visually impaired users can relate to takes on massive importance. Figure 1 shows how the sense of touch or feeling can also be used in experiencing space through sensual impressions from temperature. The connectivity to place is not just one that should be limited to sensorial but also memorial nuances that are identifiable without sight. According to Norberg-Schulz(1979) and David Seamon(2012), experiences are formed through the

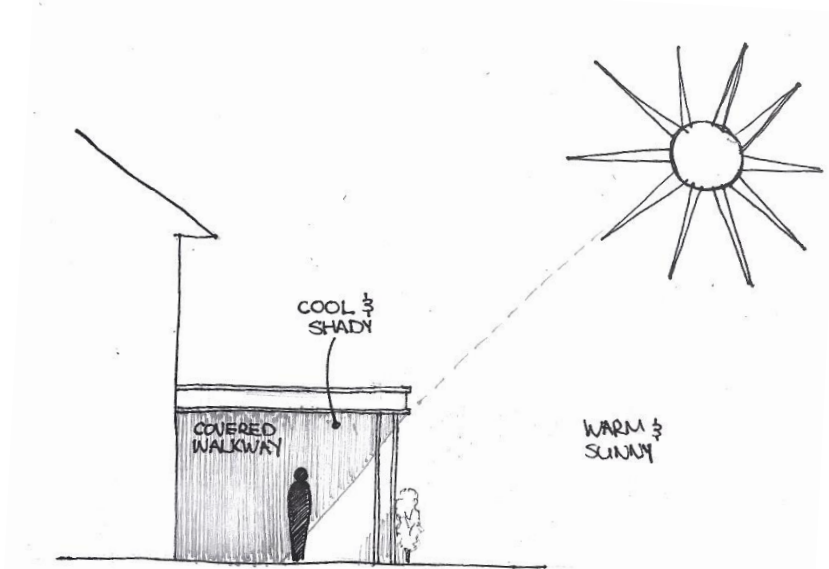


Fig. 1.1 Looking at how the sense of touch can be used as an alternative to sight in reading space. (Source: Author, 2022)

culmination of both the visual and unseen qualities of space coming together and forming an environment to which the user can relate.

Since perception is formed through the body's consciousness and experiencing a series of stimulus-impressions (Merleau-Ponty:1945), a multi-sensorial tactic would align with this approach to evoke these various senses within space to enable the facilitation of a holistic experience. This unveils how multi-sensory design should be able to have many layers to which multiple sensorial provocations can happen and how perception is not about just a singular sensorial connection. As illustrated in Figure 1.2, it is possible to get multiple sensorial stimulations from a single engagement with space or any object beyond the confines of sight. Creating such alternative connections improves how the built environment can create place through non-visual senses.



Fig. 1.2 showing how multi-sensory impressions are possible in an engagement. (Source: Author, 2022)

How architecture makes people feel can also shape one's experience and be the difference between whether people feel invited into a place or are alienated from it. When a place possesses elements of the people they can relate to, it causes the

users to feel a sense of belonging because of the connection. Sussane Langer defined architecture as being “*total environment is made visible*”. (Langer: 1953: 95) This quote expresses how the essence of architecture is about the manifestation of the total environment where its full potential is capitalised on.

Looking at the approaches of Norberg-Schulz, Seamon, Merleau-Ponty, and Langer have varying degrees of input regarding the experience of space and place. While Norberg-Schulz and Seamon agree more on experience being about what people can recognise and relate to, Merleau-Ponty and Langer see it as a sequence of stimulations that one can get in the space. These two approaches help determine how a relationship can be established between the physical and non-visual elements of architecture for visually impaired people. Creating an experience will need to speak to the need for identity in place and sensorial stimulation, which are both relevant characteristics of experience.

1.4.2 PLACE THEORY

While exploring the experience that the built form can foster for visually impaired people, one cannot overlook the importance of a sense of place, and belonging. When dwelling within space, it is also vital for visually impaired people to feel connected to the character of the place. The theory of place deals with creating spaces where people can dwell within and feel connected to a specific location. The drawing in Figure 1.3 shows how the overlap of different senses can be used in developing a multi-sensory experience that makes an easier connection to place.

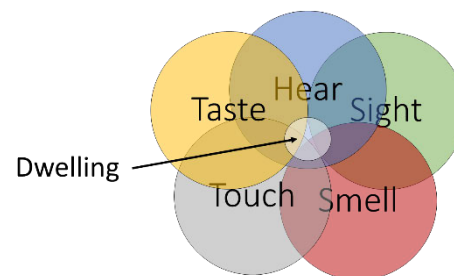


Fig. 1.3 illustrates how the overlaps of different senses can contribute to a better relationship with place. (Source: Merleau-Ponty, 1945. Adapted by Author, 2022)

The essence of place theory significantly facilitates the allowance of dwelling for visually impaired people within space. Approaching the design of any building, especially a skills development centre, requires that such a space facilitate the human need for dwelling and feel unified with the environment to enhance the atmosphere to focus on learning. Since the Skills Development centre will be situated in the coastal suburb of Umbilo, which focuses on facilitating movement arteries for the transportation of goods in and out of the harbour, it will be crucial that the modernist approach of orientation towards objects and not people does not get repeated.

Norberg-Schulz (1979) spoke of the Genius Loci, which was the spirit or character of a specific location. In looking at the theory of place, he believes that space has a unique trait crucial to its identity. The Genius Loci is essential in the construct of place as it contributes to how people relate to the space in the act of dwelling. In responding to visual impairment, it is crucial to investigate how the spirit of the place can be presented beyond the visual so that the experience of dwelling within a space is not diluted. Tackling the challenge of placelessness requires a design that harnesses the other properties and characteristics of the location, such as the haptic, audio, and aroma qualities.

Martin Heidegger (1971) further endorses this notion of a unique character when he speaks about the common human need for “dwelling”, which deals with how humans exist within the world and are enabled to connect to the character of a space. Looking at an exploration of visual impairment it emphasises the need humans have for dwelling and being able to be within space. Dwelling capitalises on the experience of being in place, the characteristics and properties that form the spirit of place. In the confines of a multi-sensory skills development center it emphasises the need to relay the Genius loci in various sensorial stimulations such as hearing, touch, and smell.

1.4.3 GESTALT PSYCHOLOGY

When looking at multi-sensorial approaches and the different sensorial stimulations that arise with them, how the body perceives the entire experience cannot be ignored. The theory of Gestalt deals with the psychological perception that people have of things and how they view them as a whole first rather than the culmination of different elements working together. Kozan Uzonoglu said “*No matter the differences and complexities that may exist within the whole the brain has a way of simplifying these to become one*”. (Uzonoglu: 2011) In relation to an exploration of visual impairment, it highlights the importance that the sub-elements have in inter-relating to each other to build the whole place. It is also essential to consider the effects that the components of a space have on each other as place is not made of isolated components but rather the interrelationship they have in forming one united whole.

Design can be sensorily evocative in multiple dimensions (such as smell, touch, taste, and hearing) that culminate in connecting the user to the Genius Loci and the experience of being in place. In selecting the site location, it is crucial to be conscious of the surrounding environment and how that also impacts the site's total experience of the skills development center. The industrial modernist-dominant environment of Umbilo would have to be considered

as to how it affects the quality of which people can dwell on the site and the sense of place to be fulfilled in the urban fabric.

Design centred around the visual sense has often limited how visually impaired people relate to the built environment. Phenomenology, Place, and Gestalt theories give an excellent platform for approaching the challenges of tackling the place-lessness perpetuated by an ocular-centric approach. All three theories look at the person's importance and relationship with space in different degrees and scales. While they are different in approach, they must be read in conjunction with one another as shown in Figure 4.

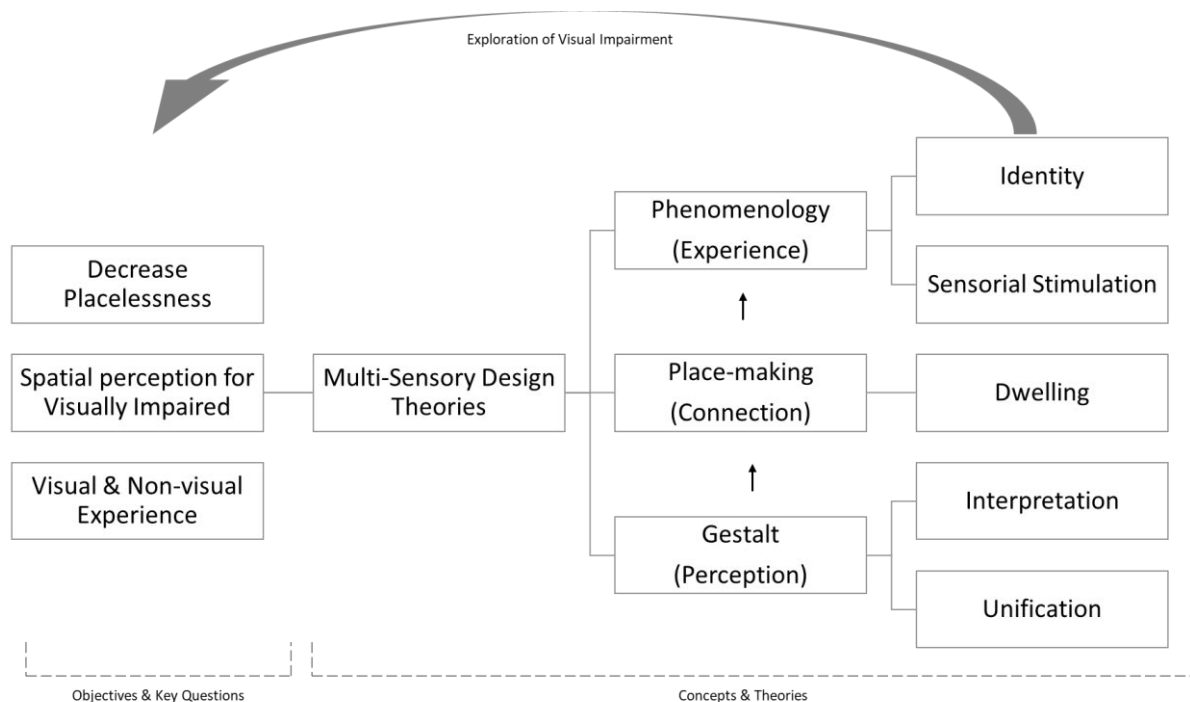


Fig. 1.4 graphically summarizes the key principles of each theory and how they should be read in conjunction of each other in approaching a multi-sensory built environment. (Source: Author, 2022)

To have an inclusive approach in designing a multi-sensory skills development center people's experience would depend on the quality of dwelling and the connections they can have to the place. Furthermore, there can be no connection to place without also looking at how the perception of a place can be fostered through a focused sensorial approach rather than overwhelming users with arbitrary impressions. This would help achieve some of the research's critical objectives in building stronger relations between the visual and non-visual elements of place to help ease the difficulties that happen with helping visually impaired people to orient themselves within the built environment more independently and feel connected to the environment around them.

1.5 RESEARCH METHODOLOGY

1.5.1 INTRODUCTION

This portion of the research will explain the research methodology used to explore the topic and scope of this study on the relationship between the built environment and visual impairment. The methodology comprised of both primary and secondary data to provide a broader scope of research on the topic and not only be limited to the research context.

1.5.2 RESEARCH PHILOSOPHY AND STRATEGY

This research is situated within the Interpretivist Research Paradigm as it measures an intangible social reality. (Alharahsheh, 2020) Since the people's experience will be the key research question, a Qualitative research approach will be used in the study as it is more concerned with people's encounters than pursuing a sole outcome. Qualitative Research can reveal the complex, possibly multi-layered nature of certain situations, settings, processes, relationships, systems, or people, which is beneficial in acquiring knowledge of people's experiences (Leedy, 2015). To explore how the built environment can create placemaking beyond the visual sense alone, the research drew upon the knowledge of people who work closely with visually impaired persons and understand their lived experiences. In order to achieve this exploration, the method of purposive case study selection and sampling was used as it allows for identifying information-rich people to contribute to the phenomena of this study.

1.5.3 SECONDARY DATA COLLECTION

The research design combined Secondary research in the form of a literature review and precedent studies with Primary research in the form of a case study, key informants and contextual analysis.

Literature Review: The theories, concepts and scholarly works were used to explore a suitable response to the research question. Various literature sources, such as journals, websites, articles, books, and medical reports, will be consulted in formulating an appropriate approach framework.

Precedent Study: Precedent studies were conducted to gain insightful information about what elements could work and what aspects do not work in the context of this research study.

1.5.4 PRIMARY DATA COLLECTION

Case Study: The case study consisted of two components, the first will be a detailed on-site architectural study of an existing skills development centre that will help understand the specific needs of such a building. Information for this architectural survey was gathered through observation, graphical analysis, and photographic documentation according to the case study schedule. The second part was done through an interview with a representative (who works at the site) from whom the information was gathered through a review regarding the site's architectural features in response to visual impairment. Furthermore, the interview was used to understand better the experience and philosophies of people living with visual impairment when engaging with the built environment. Interviewing the organisation also helped gather information regarding the health aspect of visual impairment along with its social impacts. The site for this case study was the KZN Blind Society in Umbilo, Durban.

Key Informants: Further interviews were scheduled to be conducted with an ophthalmologist & optometrist who can assist in helping in understanding the effects of visual impairment on the other senses from a medical perspective. These medical experts were from the UKZN School Of Clinical Medicine and UKZN College Of Health Sciences, respectively. Furthermore, the interview selection were to be governed by the departments advice.

All the interviews were semi-structured to be open and not limit the stakeholders' expression. Both interviews were used as Primary data collection tools and literature to support a response. All participants were contacted via email, and interviews were conducted in person and via online teleconferencing as an alternative where distance is a limitation.

Contextual analysis: A few site visits to the chosen site and surrounding context in Umbilo were conducted to gather more primary data from having experienced the site and obtaining a clearer understanding of the geographical context of the site and existing challenges.

1.5.5 RESEARCH MATERIALS

Semi-structured Interview schedule – This assisted in framing the gathering of information from the interviewees. It enabled them to express themselves whilst framing their responses according to the information needed for this research paradigm. The interviews were audio recorded and transcribed, ready for analysis.

Observation Schedule - An observation schedule was used to accumulate data for the case study. This tool helped direct what elements should be looked out for during the time that was

spent on site so that no critical information that would be valuable in the framework of this research is overlooked.

Graphic Documentation: Photographic and graphical data will also be gathered and used to analyse the conditions on the site further and seek to identify critical informants of issues and potential instruments of assistance in a multi-sensual approach. Sketches and mapping tools will also be used as instruments of analysis.

1.5.6 RESEARCH ANALYSIS

The different forms of data was analysed thematically based on the conceptual framework and themes that emerged from the literature. The primary data collected through case studies and contextual analysis was analysed through observation, thematic and graphical analysis where relevant. Interviews were analysed through discourse analysis.

1.5.7 SUMMARY

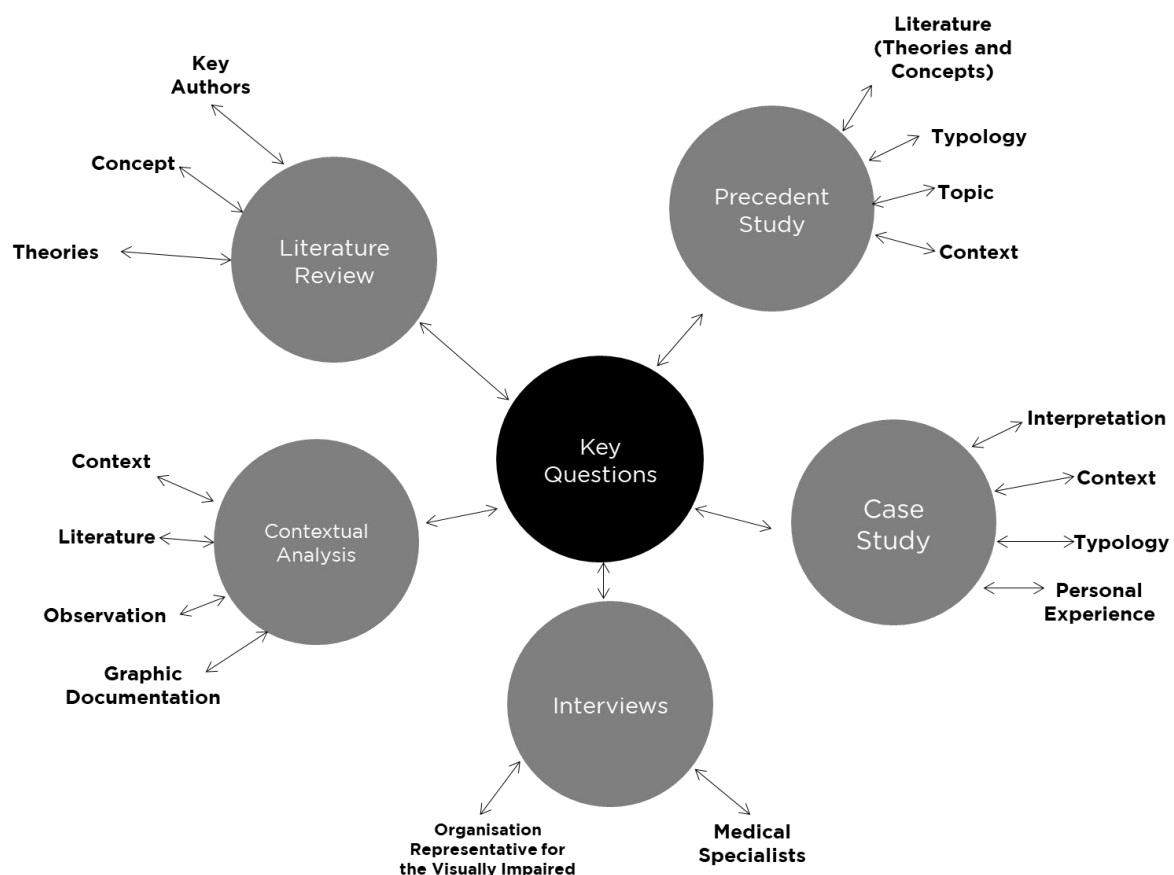


Fig. 1.5: Mind Map summarizing the research methodology (Source: Author, 2022)

Objectives	Research question	Data collection question	Data sources and sample size	Data collection methods	Data analysis methods	Data presentation form / Style
To explore the relationship between visual impairment and spatial perception	What is the relationship between visual impairment and spatial perception?	How does Ocularcentrism express itself in architecture?	Published Literature, Est. 3 Key Informants	Interview Key informants and collect primary and secondary data collection	Thematic analysis, Textual Analysis, Discourse Analysis of Interview, Observation of Case studies, Graphic analysis	Text/narrative, Illustrations, Images
To explore the role that memory plays in spatial perception and wayfinding	What is the role of memory in spatial perception and wayfinding?	What role does memory play in the present? How does memory impact spatial perception? How does memory affect way finding?	Published Literature, Est. 3 Key Informants, Case Study, Precedent study	Interview Key informants and collect primary and secondary data collection, investigating case study and explore precedents	Thematic analysis, Textual Analysis, Discourse Analysis of Interview, Observation of Case studies	Text/narrative, Illustrations
To consider how the spatial character can be experienced through the non-visual senses	How can spatial character be experienced through the non-visual senses?	What is placemaking and what is its expression in architecture? How can architecture create spatial character beyond what is visual? How can learning and working space be facilitated for alternative senses?	Published Literature, Est. 3 Key Informants, Case Study, Precedent study	Interview Key informants and collect primary and secondary data collection, investigating case study and explore precedents	Thematic analysis, Textual Analysis, Discourse Analysis of Interview, Observation of Case studies, Graphic analysis	Text/narrative, Illustrations, Images, Maps, Sketches
To analyse the effects that the built environment has on the human senses	What are the effects that the built environment has on the human sensual experience?	How is the built environment experienced through the senses?	Published Literature, Est. 3 Key Informants	Document/data study from online sources, Literature Review, Interview Key Informants	Thematic analysis, Textual Analysis, Discourse Analysis of Interview, Observation of Case studies	Text/narrative, Illustrations
To explore the possibilities of multi-sensory design and define principles for a skills development centre	What architectural design principles can inform a multi-sensory design approach suitable for the visually impaired in the context of a skills development centre?	How helpful is universal design in responding to visual impairment? How does nature help when incorporated into the design?	Published Literature, Est. 3 Key Informants, Case Study, Precedent study	Interview Key informants and collect primary and secondary data collection, exploring precedents	Thematic analysis, Textual Analysis, Discourse Analysis of Interview, Observation of Case studies, Graphic analysis	Text/narrative, Illustrations, Images, Maps, Sketches

Fig. 1.6: Research Matrix (Source: Author, 2022)

1.6 CONCLUSION

The purpose of this chapter is to offer an introduction to the background of the research problem and indicate the framework that was adopted in response. The high unemployment levels for visually impaired people can be addressed by fostering more opportunities for economic empowerment through skills development facilities. The rest of this research will explore how skills development facilities can be more responsive and inclusive spatially for people with visual impairment who need skills development. The explorations will seek to develop a framework of how design for these spaces and working can be more inclusive for people with visual impairment beyond the current universal design standards for accessibility and inclusion.

1.7 DISSERTATION STRUCTURE

Chapter One: Introduction

This chapter covers the background research that led to this study being undertaken and outlines the strategy applied to answer the research questions.

Chapter Two: Literature Review

Chapter two covers the first part of the literature review, focusing on the phenomenological experience of the built environment for the visual impaired and exploring their relationship with spatial perception.

Chapter Three: Literature Review

Chapter three forms the second part of the literature review on theories and concepts. The chapter covers the theories of Place, Universal design and then assesses the relationship between space and the senses of the human body.

Chapter Four: Skills Development Centres Background

The fourth chapter of this research gives a broad overview of the background of skills development in the context of South Africa and also an assessment of the approach of the typology of Skills Development Centres towards the visually impaired.

Chapter Five: Precedent Studies

This chapter covers the precedent studies by looking at two buildings designed to host learning spaces for the visually impaired and where skills are imparted to them. The buildings are analysed according to the theories and concepts and their expression of them.

Chapter Six: Case Study

This chapter provides an overview of a skills development facility located in the same context as this study, and the building is analysed according to the theories and concepts.

Chapter Seven: Analysis and Discussion

Chapter 7 analyses the data collected within this research and discusses the themes that were prevalent throughout the primary and secondary data that have a key role in the design strategy for the built environment to be inclusive for the visually impaired.

Chapter Eight: Conclusions and Recommendations

This chapter concludes the research and overviews the information gathered throughout this thesis's chapters. The second part of the chapter provides recommendations from the information gathered and gives a set of principles that are important in answering the key research questions through architectural design.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

This research chapter will dive deeper into the theories and concepts used to address the research questions and objectives. The theoretical framework will be built on the work of these theories and utilised as tools to approach the critical question: How can the Built environment respond to visually impaired people needing skills development? And secondary questions: What are the effects of the built environment on the human sensual experience? What is the relationship between visual impairment and spatial perception? What is the role of memory in spatial perception? How can spatial character be experienced through the non-visual senses? What architectural design principles can inform a multi-sensory design approach suitable for the visually impaired in the context of a skills development centre?

The first theory will be Phenomenology which will be broken down into the subtopics of looking at perception and the senses and constructing a phenomenological experience. The theory deals with how space is experienced and will be explored within the confines of what experience can potentially mean when someone does not have the sense of sight. A key focus will be exploring a redefinition of how experience can be governed and how architecture can still influence people's encounters when the visual sense is not being stimulated.

This will be followed by Ocular-centrism, a theory that focuses on the privileging of the sense of sight and the degree to which it has been given favour above the other senses. This theory's contribution to the visual-centred culture will be analysed, and an exploration of how the built environment can respond to this to be more inclusive of visually impaired people. The theory will further be broken down into the subtopic of looking at how Ocular-centrism impacts architecture, the visual culture that exists in society and also a critical review of the Design tools and processes that architects go through that endorse visual-centred mediums and objectives.

Gestalt theory, which looks at the psychological realm of the human being and how people perceive things, is another theory that will be explored. Its interests are in the unification and simplification of complex assemblies and looking for their simplest expression. This theory will be used in the approach of trying to figure out whether memory plays a role in how things are perceived or not. It will also help explore a multi-sensory framework regarding how different senses relate to developing a singular experience. The literature review in this portion will be made up of an inquiry into the role that memory plays in the present time and the impact that memory has on spatial perception from the Gestalt psychological perspective.

Further literature relevant to developing a response to visual impairment through architecture shall be examined in Chapter 3 of this thesis. The theories of Place, Universal Design and Multi-sensory architecture will be explored in developing a response to Visual Impairment as per the structure shown in Figure 2.1.

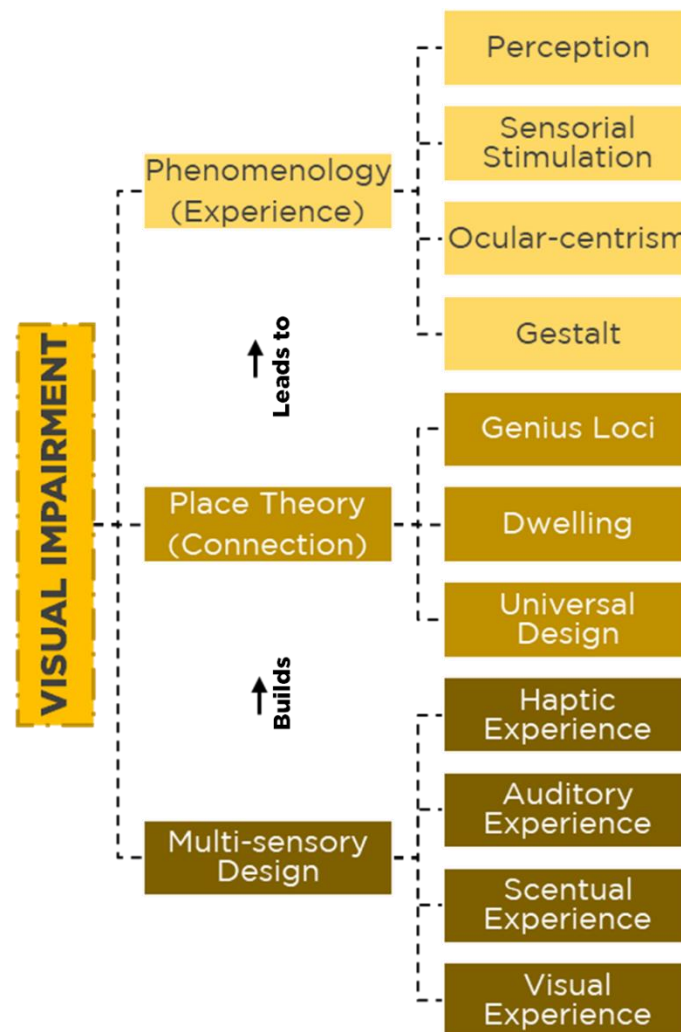


Figure 2.1 The theoretical structure of the Literature review (Source: Author, 2022)

2.2 THE ROLE OF PHENOMENOLOGY

Phenomenology is a crucial philosophical theory in how humans experience the world around them or become conscious of engagement. (De Vignemont & Alsmith, 2017) This includes the meanings and significance of confrontations for each person and how the stimulations of the senses provoke meaning for them in the first person. (Smith, 2018) Essentially it is interested in the structure of different kinds of experience, such as memory, perception, thought imagination, and social activity. (Smith, 2018) When looking at Phenomenology in the context of architecture, it looks at people's experience of space and perceives the environment. It offers an excellent platform for exploring how the built environment can be experienced through the senses. The focus on the self-consciousness of the human being in the first person and how they place themselves within the environment has massive importance in exploring the relationship that visually impaired people can have with space. (Husserl, 1963) Essentially, being within space is not enough; instead, one has to self-reflect on how the space can relate to them and experience a self-manifestation within the surroundings (Henry, 1963). Figure 2.2 shows the difference between a body-centred approach and how this can be achieved in spatial design contrasted with an object-centred design approach and its isolation of the human body.



Figure 2.2 depicts the contrasting approach to spatial design in the city of Strasbourg, France (Top) and Durban South Africa (Bottom). (Adapted from Luckan 2022 Source: Muller 2022 & Ngcobo 2021)

2.2.1 PERCEPTION AND THE SENSES

Perception is often viewed as the process in which outside events and stimulations from the surrounding environment act on a person to produce a state of mind or framework within the brain. (Gillett, 1989) This places critical importance on the human body's senses for anyone to draw connections to the space they are around. This also means that there is not only a relationship between the person and the stimulative object but also the object and neurological systems of the mind in interpreting the stimulations for the whole body to understand. (Gillett, 1989)

Primarily, the environment is usually experienced and understood through the human eye. When one can not exercise this sense, the other alternative senses assume greater responsibility in assisting those with a visual impairment in relating to objects and space around them. These alternative senses allow the brain to be conscious of the experiences and extract meaning from each encounter. The meanings and understanding come from the neuroscientific framework that accounts for every person's sensory engagement with the world and the body's movement within the environment. (Gillett, 1989)

To develop a perception of the built environment, one also needs to be able to resonate emotionally and psychologically with space. Being able to only engage with the physical characteristics of the environment will only lead to mere observation where the person can feel isolated from the object or space although being in the vicinity of it. Drawing resonance upon what can be identified intrinsically builds a perception as the space evokes what is within the viewer. For visually impaired people, it can open up stronger relations with the alternative senses. (van den Burg, 2014) In the view of Christian Norberg-Schulz(1979), the hidden and unseen qualities can boost the relationship between people and space, especially for those with visual impairment. Investing more focus on meaning through the alternative senses would improve the quality of the experience within space.

Perception is about the body's consciousness and how it experiences a series of sensorial stimulus impressions. (Merleau-Ponty, 1945) This approach gives accommodation for responsive design to visual impairment. Stimulation of the other senses can contribute to the fabrication of experience. Figure 2.3 illustrates how sensorial stimulation contributes to the perception of space and awareness of the environment.

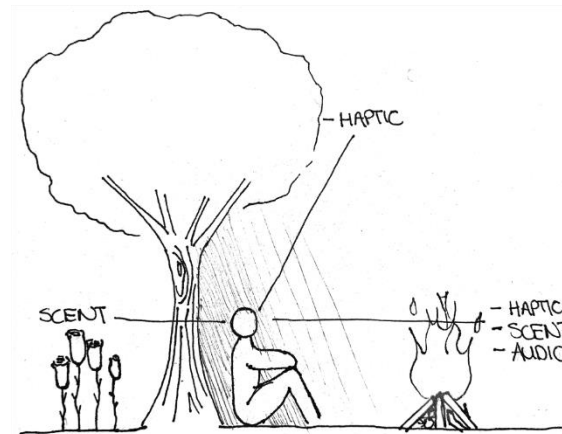


Figure 2.3 depicts how sensorial stimulations can help with spatial perception (Source: Author, 2022 adapted from Merleau-Ponty, 1945)

Evoking the other senses is valuable in developing a multi-sensory architecture that caters to being perceived by other senses. Multi-sensorial architecture can have multiple layers of meaning and resonance with visually impaired people. Looking at the work of Husserl, Henry, Norberg-Schulz and Merleau-Ponty, it is clear that perception is not just about a singular sensorial connection but the wholistic experience bringing about a consciousness of self within the area where one is located.



Figure 2.4 demonstrates a fundamental summary of what builds perception.

Figure 2.4 Asummary of how stimulation of the body leads to perception of space (Source: Author, 2022)

2.2.2 THE CONSTRUCT OF A PHENOMENOLOGICAL EXPERIENCE IN THE BUILT ENVIRONMENT

The build-up towards what makes up and contributes to a phenomenological experience is key to understanding in exploring the relationship between visually impaired people and the built environment. At its inception, the significant attributes of phenomenology look at consciousness and also a temporal awareness of the properties of an encounter. (Smith, 2018) The phenomenological experience often hinges on the framework of consciousness of previous experience that gets contextualised during encounters to formulate present experiences. (Smith, 2018)

A central theme is how one can feel an awareness of their existence and being within a space at a specific moment that leads to a unique perception (Holl, 2006). This entails a consciousness of the relationship that one has with the surrounding, whether it be internal or external to the person, that leads to an experience, as represented in Figure 2.5. For visually impaired people,

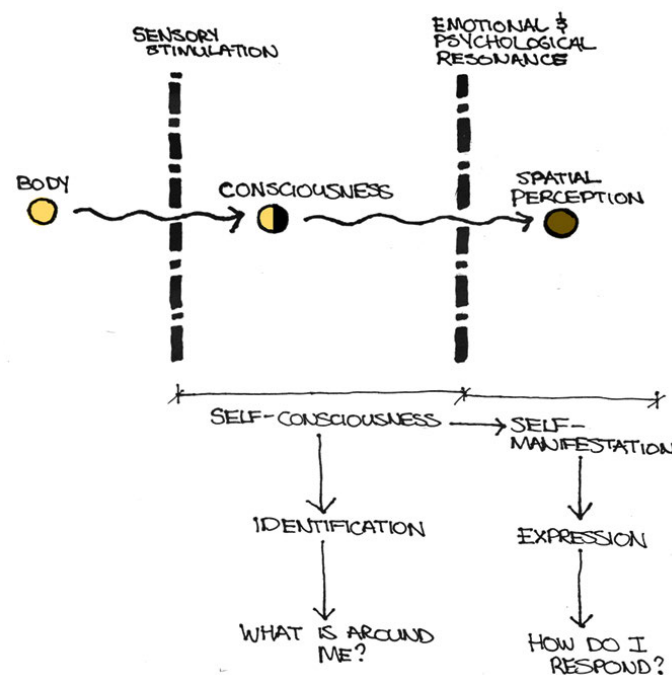


Figure 2.5 illustrates the process that the body goes through in building up to a phenomenological experience of place. (Adapted from Smith, 2018 & Holl, 2006 Source: Author 2022)

this would look at a consciousness of the senses, excluding sight, together with any other meanings they can retrieve from the engagement. Furthermore, this notion is endorsed by other authors such as Norberg-Schulz(1979) and David Seamon(2012) who also believe that experiences are formed through the culmination of both the visual and unseen qualities of space coming together and developing an environment that the user can relate to. The external parts

of experience pertaining to the body are sensually stimulated compared to the inner meaning which is psychologically based and offers far more variety due to its subjectivity. The internal meanings can be much more challenging to control than the external, which can provide more consistency in experience. (van den Berg, 2014)

2.3 THE RISE OF OCULAR-CENTRISM

The privileging of the eye above the other senses has become a dominant feature within the architectural design and manifestation of the built environment. (Lalvani, 1995) Unfortunately, the focus on aligning the built world towards this one sense creates a massive hole in how visually impaired people can orientate themselves or experience the world around them. This kind of culture and approach is given its formalisation through the imaging of the world as visual icons. (Heidegger, 1977) Pallasma (2012) furthermore believed that this modern culture offsets all people from the structures instead and preferred an object-centred approach causing an isolated experience. Due to its effects and influence in the relationship between visually impaired people and the built environment, ocular-centrism requires an exploration and further understanding. This would also help in understanding an adequate response to what has become a barrier between visually impaired people and the built environment.

2.3.1 OCULAR-CENTRISM IN ARCHITECTURE

Throughout the history of the architecture profession, many design principles have evolved over the years. Designers have often used them to govern or usher a specific code or threshold within space. These have included design principles such as hierarchy, pattern, scale and form amongst others. Figure 2.6 expresses how these principles have been implemented and tailored for the sense of sight. Whilst they have been useful tools, they all have the limitation of relying on the sense of sight to be experienced or understood and thus fall susceptible to being irrelevant when blind. They fail to help the visually impaired associate themselves with the atmosphere of that space and create an inclusive phenomenological experience where the body is put in a place where it can be conscious of the surroundings and lead to spatial perception. The visual-centric approach has created beautiful ornaments and structures for the eye but was unable to place the human

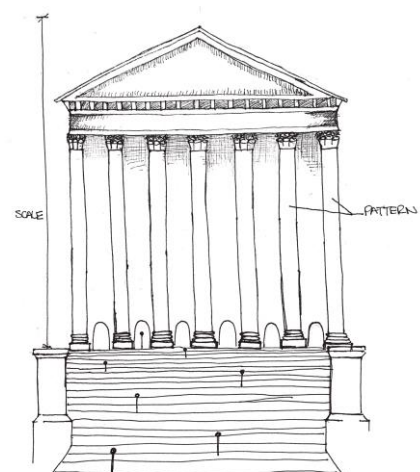


Figure 2.6 Design principles such as scale and pattern in buildings can only be interpreted through the eyes and thus exclude visually impaired people (Source: Author, 2022)

being at the centre of the space they inhabit. (Pallasma, 2012) This has to change and attention must be refocused back to humans and furthermore, those that are visually impaired to create a built environment that can be understood without sight. The code and building language must be represented beyond visually so that the essence of the environment is not taken away but rather made more manifested through alternative means to relate to the other senses.

2.3.2 VISUAL BIASED CULTURE

In his Book *Eyes of the Skin*, Juhani Pallasma (2012) offers a critical perspective on how architecture has given itself over to visual dominance as a form of interpretation. He explores alternative methods of the relation between People and the built world around them. In Pallasma's (2012: 24) view, the eyes have become the most developed of the human senses when he states that

“The only sense that is fast enough to keep pace with the astounding increase of speed in the technological world is sight.”

This revealed how the ever-changing technological landscape has created an absorption of how information is presented, giving more and more privilege to the sense of sight. The focus on this sense has left the other of the human senses behind and subdued their importance in communication. This culture has been rising exponentially with the introduction of mass media and has experienced unprecedented growth with the era of social media. The primary forms of communication through text, photo and videos have allowed people to have virtual access places that would have been difficult to experience without the world of social media. Images as a medium have grown to become commodities and their popularity has gained lots of notoriety over recent years. The experience of the world around us has become consolidated into a series of flattened images on a screen or print.

(Pallasma, 2012) This has created a demand for the production and proliferation of these icons of space. These imitations isolated the human experience of being within space at a specific moment and neglected the other characteristics of what contributed to the experience such as the emotion, haptic touch and scent to name a few. As shown in Figure 2.7 virtual access through media gives an

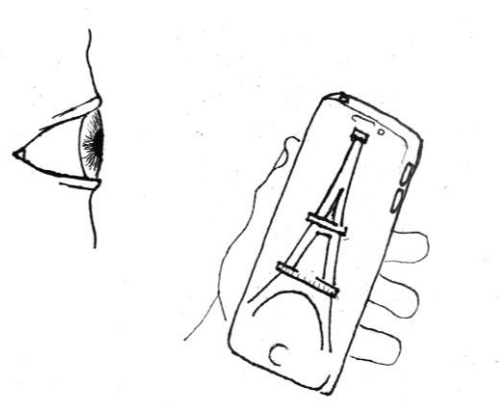


Figure 2.7 Ocular-centrism through media allows for virtual experiences of place that are isolated from the eye. (Source: Author, 2022)

augmented reality instead of an authentic experience of place.

The built environment kept up with these trends in how buildings are experienced as many buildings have become contemporised in how they are represented for the visual sense which has become the most privileged. The manner in which the culture has dictated how buildings should be moulded has left vast disparities when one has a visual impairment. Even the real world has become flattened in the sense that buildings focus on what can be tailored for images rather than inclusive spaces and architectural design for people with visual impairment. A response to the visual culture would have to decentralise the focus on the eye and give more agency to the rest of the senses so that people have a full-body experience in space and not a projection of images.

2.3.3 DESIGN TOOLS

Throughout various times in history, designers have often had to find ways in which to be able to represent their ideas for builders, clients and others to comprehend them. This was highlighted by Juhani Pallasma(2012: 22) also:

Modernist design at large has housed the intellect and the eye, but it has left the body and the other senses, as well as our memories, imagination and dreams, homeless.

His sentiments express the anchoring of design in the human eye. Even the design processes of the built environment neglect the non-visual senses in conception. Design processes are limited to visual sketches and drawings (Lefebvre, 1991) that get translated into computers where images are exported of what a building will look like and not consider what it will smell like, the temperature inside the building and audio quality as examples. In order to bring about a clearer understanding of alternative senses within the design proposals, more engagement with the tools is needed. Alternative methods of communicating spatial information can help raise more consciousness of the other senses, such as shown on Figures 2.8 and 2.9.



Figure 2.8

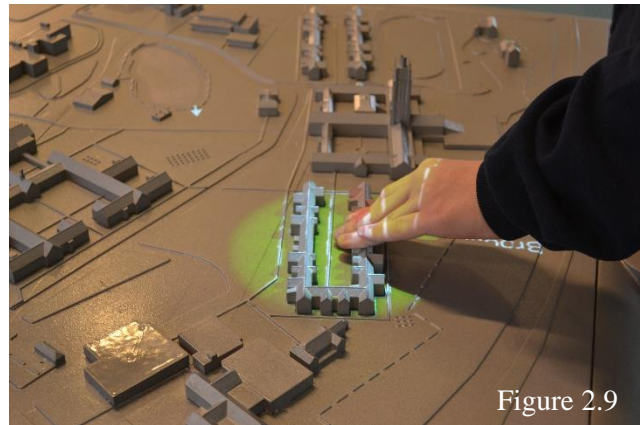


Figure 2.9

Figure 2.8 and 2.9 both look at alternative design representation tools that can be used in understanding of spatial design for visually impaired people. They use scent and tactile touch respectively which can help bring about a consciousness of other stimulants in spatial understanding. (Source: Matthew Millman, 2010 & University at Buffalo IDeA Center, 2014)

The other senses also have a role to play within a multi-sensory approach so that the built structure can be more inclusive and carefully consider the role of each sense for the visually impaired. The inception of some designs going straight to formulation through visual mediums and not considering the alternative sensual experience is another problem (Pallasmaa, 2012) and limits how a multi-sensorial can be made effective for visually impaired people. In order to overcome this flattened visual approach in design formation and truly explore a multi-sensory design, architects should consider sampling and exploring different forms of representation during the inception of a structure. The exploration of alternative representation methods would help deconstruct the ocular-centric design processes that give visual bias to the eyes and give more agency to other senses.

2.4 GESTALT PSYCHOLOGY – UNIFIED SENSORY EXPERIENCE

When looking at multi-sensorial approaches and the different sensory stimulations that arise with them, how the body perceives the entire experience cannot be ignored. The psychological theory of Gestalt brings a critical perspective through its dealing with perception and how the human brain interprets different parts of a thing as a unified whole instead of isolated elements. Kozan Uzonoglu and Semra Sema Uzunoglu (2011: 1000) defined this as following:

“Gestalt Psychology” is a notion indicating that an organism tends to perceive a stimulus as a whole.

In relation to an exploration of visual impairment, it highlights the importance that the sub-elements have in inter-relating to each other to build the whole place. It is also essential to consider the effects that the components of a space have on each other as a place is not made of secluded components but rather the interrelationship they have in forming one united whole.

2.4.1 THE ROLE OF MEMORY IN THE PRESENT TIME

Significant events that happened in the past influence and frame how current experiences are perceived (Koffka, 1936). These can have a variety of effects on the present experience, whether they are positive or negative. The way in which we deal with and approach encounters have strong ties with the past even though we live and exist within the present continuous time (Koffka, 1936). Thus, memory has the power to connect humans with the past and keep the link to the past alive as they experience the present and approach future engagement. (Sherwood, 2015) Looking at this ability can also assist in exploring visual impairment through architecture, as the body and psychological memory can play a big role in how architecture and space are perceived through the encoding of the memories. These are usually encoded visually, acoustically, semantically, and tactically in relation to their storage in the human psyche (Brown, Roediger, & McDaniel, 2014) Certain stimulations or encounters that have been experienced before can give the nuances of previous events that are rooted in our memory. (Sherwood, 2015) This can help with present engagement as the habit of having experienced something before can make it easier to navigate and orientate oneself in the present moment as the body and mind receives a repetition of what it has already experienced.

2.4.2 IMPACT OF MEMORY ON SPATIAL PERCEPTION

Elements of situations and environments that people go through can formulate how they respond to similar situations and environments that have commonalities with previous encounters. (Eagly & Chaiken, 1993) In dealing with visual impairment, recollections of sensual experiences are also helpful in the orientation within the space or its elements. The commonalities which exist and are recognisable with features that users are familiar with help in the perception of a space. For instance, the scent of a meal at a restaurant can remind one of a meal that was once cooked in their own kitchen at home. For the visually impaired observer, this would not only communicate the presence of a kitchen or cooking space even without seeing it but also can help with feeling secure in the environment as there are elements that they can recognise that remind them of a space where they feel safe and secure in. Figure 2.10 shows how stimulation

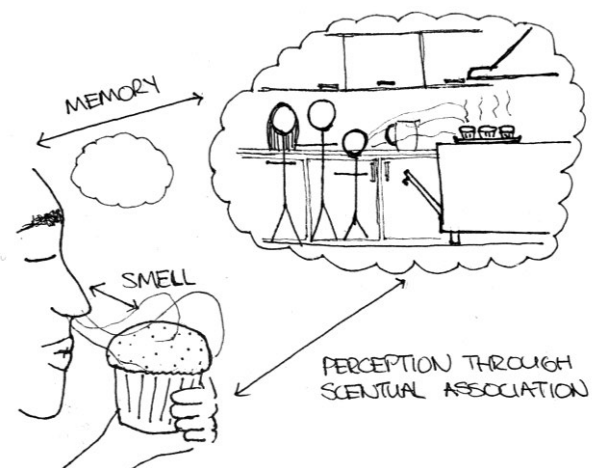


Figure 2.10 Illustrates how scentual stimulation can trigger a memory which is associated with the scent. (Adapted from van den Berg, 2014)

of memory through the senses can assist with perception. Incorporating sensually and memorially stimulative elements within architectural design becomes necessary to make it easier for space and the environment to be perceived, especially for visually impaired people. The memorially stimulative elements would then play a part in the bigger scheme of the experience of architecture and not necessarily become the centre or core of the attention.

One of Gestalt Psychologies' principal laws, the law of similarities, also endorses the notion of things being perceptually linked together whenever there are similarities between them (Soegaard, 2012). The various principles of Gestalt psychology can be seen in Figure 2.11 and how the mind searches for the simplest expressions. The notion behind the psychology is based on the perception that the whole is made up of the different parts. (Sternberg & Sternberg, 2012) Based on this principle, memory can

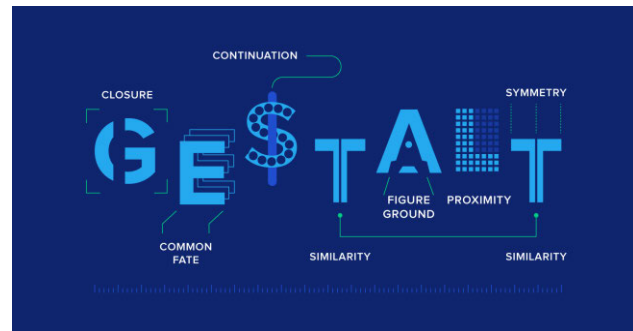


Figure 2.11 Shows the 7 key principles Gestalt theory (Source: <https://www.toptal.com/designers/ui/gestalt-principles-of-design>)

be viewed as a part of elements that assist in how space is perceived when designs incorporate or sample elements easily recognisable to visually impaired people. Furthermore, this is endorsed by another Gestalt principle of past experience where events from the past create a framework for data interpretation. (Tordovic, 2008) These will be explored further under section 2.4.3 in how Gestalt Psychology links to perception. Based on what has been experienced, people have the urge to link new information back to what they know and understand. These principles help open up the built environment to become meaningful and not isolate those that are blind to make it easier for spatial perception for visually impaired people and enable stronger recognisable bonds to the environment around them.

2.4.3 GESTALT AND PERCEPTION

Whereas memory has a key role to play within the construct of experience, the way the senses relate and are stimulated is also a key contributor to spatial perception. (Sternberg & Sternberg, 2012) Building from Gestalt psychology which is about the brains desire to recognise patterns or configurations between elements. (Britannica Concise Encyclopedia, 2008) How the human brain seeks to group and then simplify information thus has to be considered in how the different sensory stimulative elements are deployed in design. Including a vast array of

uncurated elements could also lead to a confusing space to inhabit and thus lose the meaning within the space due to interpretation difficulties for the visually impaired. Through the Gestalt psychological framework, it is clear that space can be read as a whole and not just a compilation of isolated objects. This creates a harmonious atmosphere within the space (Zumthor, 2006) as the mind seeks the simplest unified expression.

The mind seeks to unify the surrounding environments and external elements, and the body also seeks to be unified with it. Pallasma (2012: 43) expressed this when he said:

I experience myself in the city, and the city exists through my embodied experience. The city and my body supplement and define each other. I dwell in the city and the city dwells in me.

This reveals the urge that the body has to seek to understand and experience space and its unification with the space and how they interrelate with one another as an organism. A multi-sensorial approach to visual impairment should consider how visually impaired people not only understand the spatial terrain surrounding them but also how their bodies are conjoined within that space and harmoniously interrelate with it.

2.5 CONCLUSION

From the literature that has been discussed thus far in this chapter and the theories within them, they have shown how experience is essential in responding to visual impairment and how the approach to design and its processes need to be reformed to be more inclusive for people that rely more on alternative senses that aren't sight. Without these considerations being made it continues to perpetuate a meaningless spatial relationship with buildings. Thus, the blind will continue to be isolated from the built environment experience, which has further emotional effects when people feel foreign to the space they are around.

The theory of Phenomenology highlights how experience is vital in the relationship between visually impaired people and the built environment. A critical component of this is self-manifestation and the urge for people to see themselves within the environment. This places a demand on how the built environment can formulate a sensually stimulative response that brings about self-awareness within the space. This then ties to Gestalt Psychology which explores how the human brain seeks to obtain the simplest expression of any given elements. In comparison to the sensually stimulative approach of Phenomenology, it focuses on how the

body amalgamates the different stimulations to form a unified whole rather than interpreting them as separate elements.

Furthermore, memory also plays a crucial role in how any encounters that happen in the present moment are viewed through the framework of past events. When the built environment possesses traits that link to recognisable elements of the past, it can attach meaning to the space and thus can help visually impaired people relate to a space based on previous encounters that they have had prior with other spaces. This is then included in how they would experience that space. The intangible memory is combined with the external elements and both unify in the interpretation of space.

Lastly, the theory of Ocular-centrism highlighted the visual bias that currently exists in the broader modern culture and more so the architectural field and its manifestations. Responding to visual impairment through architecture would have to move away from design curated only for the eye. This doesn't mean eradicating the relationship between buildings and the eye but rather adding to it and enhancing the meaning of space through other senses. Such would allow for architecture to be more inclusive to people beyond just those that are visually impaired.

CHAPTER THREE: LITERATURE REVIEW

3.1 INTRODUCTION

The second part of this literature review will continue the exploration that began in the previous chapter by diving deeper into the theories and concepts to address the research questions and objectives. The theoretical framework will be built on the work of these theories and utilised as tools to approach the critical question: How can the Built environment respond to visually impaired people needing skills development? It shall address the latter secondary questions: How can spatial character be experienced through the non-visual senses? What architectural design principles can inform a multi-sensory design approach suitable for the visually impaired in the context of a skills development centre?

Place will be the first theory that will be studied, along with the subtopics of the Genius Loci and Dwelling. The theories will deal with how visually impaired people can connect to the built environment and identify themselves within space. These will address how spatial character can be experienced through the non-visual senses. Furthermore, it will look at how place theory can be redefined to suit visually impaired people.

In addition to this, a critique of the Universal design approach shall also be added. This will include a general review of the inclusivity of visually impaired people in the built environment. This will offer a platform to improve on the current design approach to be even more effective in design principles for skills development facilities for visually impaired people. This will be aligned with the critical questions of how the character of a space can be expressed non-visually and the design principles for responding to visual impairment.

Lastly, the concept of multi-sensory architecture shall be explored to understand a suitable response to visual impairment better. This will look at a few other methods of sensorial stimulation that can supplement spatial perception when one is visually impaired. The subtopics will explore how some senses can be better incorporated through careful design targeted at the alternative non-visual sense. This will be used to frame a response approach to designing for visually impaired people.

3.2 CONNECTION TO THE ENVIRONMENT

While exploring the experience that the built form can foster for visually impaired people, one cannot overlook the importance of what a sense of place and belonging has. When dwelling within space, it is also vital for visually impaired people to feel connected to the character of the place. The theory of place deals with creating spaces where people are allowed to dwell within and feel connected to a specific location. (Heidegger, 1971) The essence of place theory significantly facilitates the allowance of dwelling for visually impaired people within space. Approaching the design of any building, especially a skills development centre, requires that such a space facilitate the human need for dwelling and feel unified with the environment to enhance the atmosphere to focus on learning.

Unison with the environment significantly affects spatial experience and habitation quality. (Alexandra, 1979) This unification allows for a system to be at peace when elements are in harmony with one another in their systematic interrelationship. Pallasma (2012) highlights that this harmonious inter-dwelling is one of the human body's core desires, which shows how one can not be separated from the urge to want to be in harmony with space. Activating the alternative sensorial elements would begin the journey of correcting where visual-centred design has fallen short. The non-sight senses would allow for orientation and connection to the dweller of the space, being the visually impaired.

One of the hindrances of being able to experience the “Quality Without A Name (QWAN)” that Christopher Alexandra (1979) mentions explicitly is the preference for images within society. As mentioned in the previous chapter, their principle of tokens opposes the natural way of the autonomous and whole environment. The imaging of space through media or design leaves the human being as an isolated element in space, observing only. Learning from the organic constructs of place seen through nature (Alexandra, 1979) is valuable in how place is not only made up of the aesthetic of the elements but also those that cannot be seen, such as the whistling of the wind as it sweeps from one side to the other, or the scent of the aroma of freshly boomed flora in a garden. Although one might be visually impaired, they can still be able to habitate the space where such events happen and be able to experience the quality of the place due to the sensual qualities and stimulants of the space that are accessible to them and the space being made out of the combination of these properties.

3.2.1 GENIUS LOCI RELATIONSHIP

Norberg-Schulz (1979: 14) spoke of the Genius Loci, which was the spirit or character of a specific location. In looking at the theory of place, he believes that space has a unique trait that is crucial in its identity. He said the following in his publication *Towards a Phenomenology of Architecture*:

“The character is determined by the material and formal constitution of the place. We must therefore ask how is the ground on which we walk, how is the sky above our heads, or in general, how are the boundaries which define the place.”

This quote highlighted how most of the properties that define a space are often limited to the visual and how a response to visual impairment in the built environment should seek to create the characteristics that define a space independent of what can be seen.

The Genius Loci is essential in place as it contributes to how people relate to the space in the act of dwelling and the symbolism that can be extracted. (Røe, 2014) In responding to visual impairment, it is crucial to investigate how the spirit of the place can be presented beyond the visual so that the experience of dwelling within a space is not diluted. Tackling the challenge of place lessness requires a design that harnesses the other properties and characteristics of the location such as the haptic, audio, and aroma qualities. Place should not be defined by a singular characteristic but by overlapping different qualities. (Røe, 2014)

The identity of a place defines it and how humans will relate and even identify themselves with the space they are in. The unique character of the environment can govern the type of relationship that people have with the space they are in. (Røe, 2014) Usually, in design, this is limited to ocular-based visual landmarks, but in an attempt to redefine this, the alternative characters of the space either have to be highlighted or incorporated into the design. Perhaps nature can be considered and how the character of an environment next to the river or the scent of a garden can be read. The audio qualities and rhythm of the water or the fresh smell of flora can help us relate to the environment without sight.

In modernist-dominated towns or cities, the trait of place does not get highlighted with care and has abstractly fabricated the identity of the city. (Relph, 1976) This abstracted minimalist approach has often neglected the fostering or creating a positive character of a place due to the drive for globalisation. Kevin Lynch (1960) noted that what defined urban environments were the paths, edges, districts, nodes, and landmarks. He believed that these elements created

mental images of the city to the people, which portrayed how a connection to the environment often has not considered characteristics beyond the visual sense. The focus of these elements also rests on the movement through spaces rather than the quality of the relationship to place.

To be able to redefine the perception of the Genius loci accordingly, it is paramount that the essence of what we focus on in building up the environment and how identifiable it is for various users within communities. The paths, edges, districts, nodes and landmarks ought to be more than just the backdrops of meaningless elements but should be viewed as platforms for psychological and spiritual engagement where the encounters and the nuances of interrelationship are intimate.

3.2.2 DWELLING IN PLACE

A key principle of place theory is the act of dwelling. Martin Heidegger (1971) highlights this in his book *Poetry, Language, Thought* when he endorses the notion of a unique character when he speaks about the common human need for “dwelling”, which deals with how humans exist within the world and are enabled to connect to the character of a space.

According to Heidegger (1971), dwelling is not an isolated incident or activity divorced from common rituals or their surroundings, such as work or travel but rather it is also found within the confines of other activities. This is a critical view as it brings to the forefront the fact that our relationship to things as humans is not just merely platonic. (Tuan, 1977) Opportunity exists within each confrontation for humans to be able to dwell. The built environment that surrounds people should not just be viewed as shelter to be inhabited but rather a space for dwelling which allows for psychological, emotional, and spiritual experiences. The two are not independent functions of each other but are properties that synchronise to formulate the place. (Heidegger, 1971) The quality of space that is formulated is at its best when total freedom is given to the people within the space to feel at home through the enablement of expression of the whole being. (Alexandra, 1979) This comes from an inner peace that dwelling in a space in which one can be relaxed. This relaxation is evoked through being able to feel safe in an environment and not foreign. The ability to perceive and relate to the elements around one can be an antidote to foreign space. (Roe, 2014) The approaches of Heidegger and Alexandra highlight the importance of freedom and inclusion in the act of dwelling for visually impaired people. This allows them to have stronger relationships with the built environment. Space not only has a habitative responsibility but also enables wholistic freedom of the people who dwell within it. This can be achieved through a design and sensually coherent building strategy.

The concept of dwelling within a multi-sensory skills development centre would, therefore not only be defined by the relationship between people with visual impairment and the habit of learning or production, but also by the relationship of the space that is around them. The building has a key responsibility in providing a platform where it doesn't act as a shelter but rather a canvas for the user to be whilst partaking in varieties of rituals, even if the ritual is walking.

Connecting with the surrounding also has emotional benefits, as it brings peace and calmness when the people and the space are in harmony. Martin Heidegger's (1960) work advocated that space possesses this harmony when it facilitates quality encounters for the users of the space. Furthermore, Norberg-Schulz's (1979) work in Phenomenology, which was established on top of Heidegger's philosophy writings, highlighted how space has an invisible character and identity that defines it and how people's ability to locate themselves within it is beneficial. The construct of place and the ability to dwell is constructed through the unified experience of all these factors. This also includes the phenomenological experience by facilitating for the body to have a state of consciousness before perceiving the space around it.

The risk of ignoring this trait of place is that the context where people find themselves ends up as just inanimate objects located at a specific distance away from one another. (Tuan, 1977) Many of the Modern and contemporary design approaches often did this and perpetuated placelessness (Relph, 1976) where minimalism was a big influence and designers saw less as more. (van der Rohe, n.d) This alienates visually impaired people; thus, opposition to minimalist design is needed. Ornaments and edges ought to be able to carry meaning beyond what the eyes can grasp. The act of design also needs consciousness of the properties or traits that exist within space and seek to highlight or draw upon the meaning of it.

Looking at an exploration of visual impairment, humans have a key need for dwelling and being able to be within space. Dwelling capitalises on the whole experience of being in place, the characteristics and properties that form the spirit of place. The confines of a multi-sensory skills development centre emphasises the need to relay the Genius loci in various sensorial stimulations such as hearing, touch, and smell.

3.3 DEFICIENCY OF UNIVERSAL DESIGN APPROACH

From the middle of the 20th century until the modern era, sensitivity and awareness about inclusivity in the usage of products and engagement with space have increased. (Case, 2008) What began as a movement of barrier-free design became accessible design, that would further evolve into Universal Design (UD). (Case, 2008) This would be established around the aim of designing products and environments to be usable by all people, irrespective of age, size, disability, or any other factors, as best as possible without any need for adaptation or specialised design. (Connell, Jones, Mace, Mueller, Mullick, Ostroff, Sanford, Steinfeld, Story, and Vanderheiden, 1997) The main principles that this would be built around were: Equitable use, Flexibility in use, Simple and intuitive, Perceptible information, Tolerance for error, Low physical effort, size and space for approach and use. (National Disability Authority, 1997)

Universal Design has brought in many good principles for the inclusivity of people living with disabilities to be able to access and relate to the built environment. (Mase, 1997) Unfortunately, it has left vast uncovered territory in inclusivity for visually impaired people as it does not consider the Phenomenological aspect of the built environment. Ronald Mase (1985, 147-152), a pioneer in the consciousness of this approach, defined it as:

“‘Universal design’ means the design of products, environments, programmes, and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design”

This doesn't address the quality of the connection of dwelling within space and being unified within place. One of the key principles of Equitable Use and Perceptible Information aims to communicate necessary information effectively to the user (Connell *et al*, 1997) which are helpful for wayfinding, but under closer examination, lacks in considering the value of being in place and its experience. The current standards in the principles allow for a level of observation of the environment and facilitate mobility and accessibility around it. The parts of the strategies for dealing with visual impairment through alternating surfaces for navigation zones are helpful in navigation but not much in an experience of place. As per Figure 3.1



Fig. 3.1 shows how the transition between carpet and wooden flooring material can be used as spatial definers for visually impaired people. (Source: Irish Guide Dogs for the Blind, 2012: 14)

one can see how material transitions in flooring or any plane can be used as a spatial zoning instrument. This kind of approach bears an inadequate consideration for the quality of dwelling in space and the level of experience and relationship that visually impaired people have with space. The spaces merely provide access and orientation without allowing visually impaired people to see themselves within space. (Henry, 1963)

Steinfeld and Maisel, (2012) expounded on these principles in the Goals of Universal Design by establishing further principles of Comfort, Awareness, and Understanding, which began to shift the focus towards the quality of relations between visually impaired people and the built environment. These incorporate and consider the phenomenological and place experience for people with visual impairment but exploration within the confines of a Skills Development centre. Considering how Skills development facilities for visually impaired people are common dwelling areas for learning and working, the focus cannot be on mere arrival and departure and navigation around the space but also allow for quality dwelling experiences. (Steinfeld *et al*, 2012) Greater consideration is needed within the universal design inclusivity strategies as there isn't enough focus on making the built environment not only perceivable for visually impaired people but also connectable and embracing.

3.3.1 UNIVERSAL DESIGN IN THE URBAN ENVIRONMENT

When looking at the philosophy of universal design in creating inclusive and accessible environments (Connell *et al*, 1997) the urban fabric cannot be overlooked. Due to the desire of the body to achieve a state of unison with the surrounding environment and experience a sense of place (Alexandra, 1979), being able to facilitate for connection to the buildings and infrastructure in the urban landscape is critical. The relationship that different spaces have with each other becomes critical as the relationship between the body and the built environment does not begin at the arrival on one site but instead also includes the journey between the departure from one site to the arrival on another in order to maintain a spatial consciousness for the visually impaired through that encounter. (Smith, 2018) According to research by Wolfgang Preisner and Korydon Smith(2011), there is a severe lack of technology infrastructure and the proliferation of it in cities to form networks that people with visual impairments can be able to use no matter which part they are in. Interventions in the urban framework of the city are often put at landmarks and thresholds, such as traffic lights at street intersections, but when left isolated from one another without clear linkages between them to assist in making the journey more inclusive and accessible.

Making the environment more accessible is essential in bringing in and considering the phenomenological experience at the urban scale. This is built through constantly enabling a state of spatial consciousness regarding navigation around and understanding spaces. In light of the work of Michel Henry(1963) the environment should be made to enable self-manifestation of the human body in space. For the visually impaired, this would not only look at achieving it in various thresholds or landmarks but also create constant sensorial stimulative spaces along the journey and create a network linking sites with one another and the context of what exists around them.

3.4 INCLUSIVITY THROUGH MULTI-SENSORY ARCHITECTURE

Whether architectural designers approve or accept it, every encounter the body has within space, irrespective of its orientation, is a multi-sensory experience. (Pallasma, 2012) The different sensual elements fuse to formulate one experience that the body reads as a whole (Sternberg & Sternberg, 2012) as explore through Gestalt psychology in section 2.4.2 and 2.4.3. In the Built Environment, this merged experience is dominated by the sense of sight, which overpowers the other senses due to its careful curation and the imbalanced focus against the other senses. (Pallasma, 2012) This has led to a general focus on the eyes being the primary form of perception medium of buildings and space and overlooked the other properties of space as a key part of it. This notion goes against the organic system that can be experienced within nature's environment, where the scenery's image does not overpower the person's existence. However, the body is allowed to exist fully as being in place encapsulates multiple senses having an equal bearing on the experience. Figure 3.2 shows an example of how the body

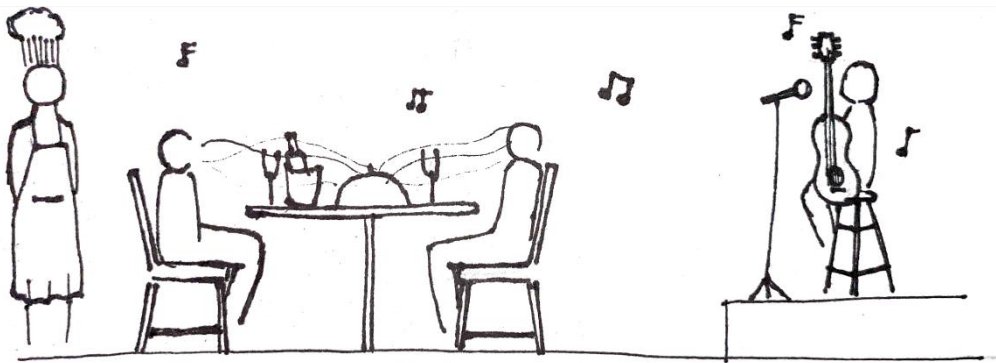


Fig. 3.2 The body reads multiple sensorial triggers that contribute to the whole experience of being in place. (Source: Author, 2022)

perceives the multiplicity of properties within place when in an environment. This shows how the expression of different senses can lead to better encounters with space. Adopting this approach to how spaces are designed would allow visually impaired people to experience a greater sense of being in the world and more of themselves being expressed in the built environment.

The eyes are not just an independent organ in the act of perception. They also depend on relating with the other senses. Juhani Pallasma (2012: 46) expressed this through the following:

Vision reveals what the touch already knows. We could think of the sense of touch as the unconscious of vision. Our eyes stroke distant surfaces, contours and edges, and the unconscious tactile sensation determines the agreeableness or unpleasantness of the experience.

This reveals how one sense can offer the foundation for the eyes to perceive accurately. He also looks at how the sense of touch is a form of vision in terms of being able to read surfaces, edges and other tactile information that creates a perception in the mind of that space. Figure 3.3 also expresses this, as can be seen in how an image of the surroundings can be formulated through alternative sensorial engagement and how alternative senses can be used as perceptive tools. This reveals how alternative senses are sufficient to interpret the world around us. This also exposes how design should offer more consideration for the elements in the built environment that speak to these senses.

3.4.1 HAPTIC EXPERIENCE

One of the most direct and intimate forms of relation beyond one's self happens through the sense of touch. This sense operates through the organ of the human skin and can interpret a multiplicity of haptic information such as texture, temperature, topography, the hardness of a material and its strength. As previously mentioned, Pallasma (2012) highlights how touch can independently formulate and interpret information ahead of the eye. This reveals how the strong sense of feeling is able to reach one before retinal information. The body can read and feel the temperature difference of standing under a shaded area on a hot day and then understand the presence of a structure whereas the eye cannot feel the



Fig. 3.3 The sense of touch can also be used a method of gathering data for spatial perception (Source: Pallasma, 2012)

quality of space without the haptic sense. According to the Freudian theories “pleasure of function” and “pleasure of organ”, this connection is viewed as the natural desire of any human being. (Tisseron, 1994) Hapticity can read surfaces in space and lead to an intimate connection with space that can lead to great satisfaction. This connection can present the dweller with symbolic connections that remind one of pleasant memories, such as walking on soft grains of soil can trigger a memory of being at the beach shore on a leisure excursion.

The Haptic sense feeds the mind perceptive information regarding surfaces and outer elements that can be felt and offers excellent assistance in reading and navigating the space. (Herssens

& Heylighen, 2008) The different textures, temperatures and other haptic information within moving through a building helps visually impaired people obtain a deeper connection and understanding of space. This also puts greater responsibility on architectural designers to move away from one of the Modern contemporary architectures' most significant shortfalls in how this sense has been overlooked in the act of design and mono-surface clean spaces with flattened tectonics. (Pallasma, 2012)

3.4.2 AUDITORY EXPERIENCE

Whilst sight isolates those people with visual impairments in space, audio can reignite the perception of the surrounding world. The vantage scope with sight also only allows for gazing in a specific direction, whereas sound is omnidirectional and can be experienced without direct orientation and encapsulates the totality of the region of space. (Pallasma, 2012)

Whilst this sense is often overlooked in how space is perceived, it possesses much significance in reading elements such as depth, scale, atmosphere and volume of repetition. (Rasmussen, 1993)

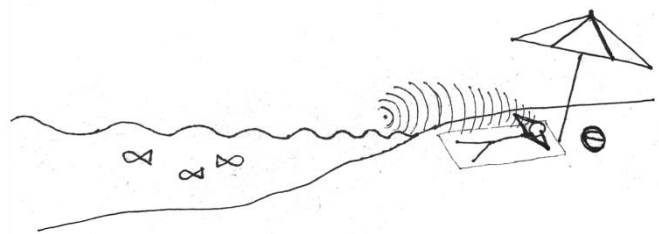


Figure 3.4 depicts how spatial information can be communicated through sound and the magnitude of the spatial information through rhythm and audio repetition (Source: Author, 2022)

As seen on Figure 3.4 the noise and sonic atmosphere in a location can create a perception of the environment. Even though one can be visually impaired, it unlocks the human imagination to formulate an image of what the surroundings might be like according to the understanding of the perceiver. Auditory features of space, such as the echo in a vacant area or unfurnished home, can communicate the visual properties of the existence or non-existence of elements. The crowd's noise applauding something they are pleased about can communicate the capacity of an area or an organ being played in a cathedral and create an ambience that visually impaired people can perceive from an auditory communication into a spatial understanding through how sound reverberates from the structure and materials of a building. (Rasmussen, 1993) This sense offers an excellent alternative point of connectivity to the built environment as it gives visually impaired people a chance to understand the environment surrounding them and their position and role within it. Recognising self and being able to orientate themselves accordingly will strengthen their relationship with the built environment. In a skills development facility, using sound or silence to communicate the different functions and properties of each area or room will be vital in communicating the function of each space.

3.4.3 SCENTUAL EXPERIENCE

One of the most dominant senses in formulating a memory of an experience is often scentual stimulation. (Pallasma, 2012) The ability of the brain to detect over 10 000 different odours only requires as few as 8 molecules to trigger a sensation of a scent. This triggering of the memory through smell allows us to re-enter a space through recognition of the odour we recall as illustrated in Figure 3.5. Where the retinal memory could have forgotten details about a space, their nostrils can bring the forgotten memory back to life.(Van den Berg, 2014) The peculiar scent in an area can be a vital informant of the environment around it, such as the scent of flowers with a strong odour can inform one about a garden as seen on figure 3.5 or the smell of freshly baked muffins in a café may trigger a memory of a set of muffins one baked with their loved ones in a kitchen. As seen on Figure 3.5, this sense has close relations to a person's

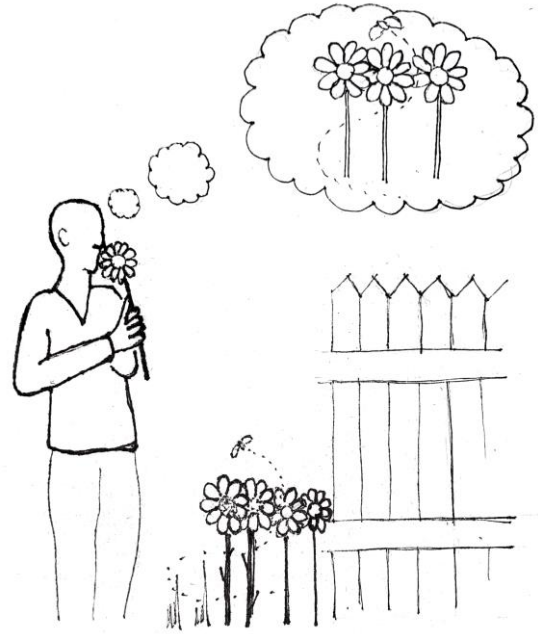


Figure 3.5 Illustrates how scentual stimulation be an important cue in environmental perception. (Source: Author, 2022)

emotions as it carries certain feelings with the past that cannot be erased from our memory. It transforms a sterile environment into a nuance-injected space. The powerful nature of scent in bringing the environment to life can counterbalance visual impairment as the aroma that exists in a space can help the mind formulate an imagination of the environment. Scent can relay what kind of space we are in based on the distinct mix of aromas and what activities are found there, such as the smell of oils and fluids in a motor mechanics workshop communicating a space for vehicle repairs. This enables visually impaired people to have a stronger connection to the built environment when they can perceive spaces according to the scent that is found in the space where they are dwelling.

3.4.4 Light and Colour

Due to the different kinds of visual impairments, some people are still able to see light and colour to varying degrees. (Murray, McKay & Nieuwoudt, 2011) This ability enables them to perceive varying ranges of light and darkness, bright and dim colours. The contrasts between

these can help with the perception of space as these properties can be coded to give definition to the spatial and structural characteristics of the built environment.

For example, light can be illuminated monotonously (in a space) in a manner that would spread equally and not offer much stimulation. The very same light would communicate different characteristics, such as highlighting or emphasising an area of importance when spread unevenly and compressed along a specific path or field of interest (van den Berg, 2014). The presence and absence of light in a space also enables visually impaired people to gain stronger perceptions about the materiality of surfaces around them as a clear glass pane enables light to penetrate into a space, but other surfaces like brick walls do not enable that. Colour in a similar way to light, can also help in highlighting certain fields of interest spatially. Figure 3.6 illustrates how colour can be used to give better spatial definition in the built environment.



Figure 3.6 shows how the contrast in colours and using them as spatial coding tools can assist in differentiating spatial information for visually impaired people. (Source: Duivenbode, 2016)

3.5 CONCLUSION

Looking at the theories that have been reviewed in this chapter, they highlight the importance of connectivity and identity with space. This is important in improving the experience and relationship between visually impaired people and the built environment. It is imperative that the built environment creates stronger links to the visually impaired and adopts a multi-sensorial approach. This approach leads to the authenticity of the built form and the experience that it gives.

Place theory focuses very well on the importance of the body and self-consciousness within space. The quality of being within space the visually impaired experience is crucial in strengthening their spatial perception and experience. In developing a design approach for a

skills development centre, it will be crucial to look at creating spaces that will foster orientation and identity for the users. This framework then shows how Universal Design was unsuccessful in achieving the goal of inclusivity for visually impaired people within the design principles responding to them. Whilst many principles assist with orientation and navigation around the built environment, they overlook the importance of a sense of place in space for people who are partially sighted or non-sighted. Whilst some principles were revised to try and integrate place theory, they do not consider it for Skills Development facilities. The principles of multi-sensory design can help merge the essence of place through the alternative senses. It assesses the value of being in space and highlights how various methods can be achieved through non-visual sense. The sense of hearing, smelling, touching and partial sight can supplement visual impairment and can be used as great tools for spatial perception.

The next chapter shall begin the exploration of how the theories and concepts discussed in this chapter have been formulated through designs of facilities for visually impaired people. The precedent studies shall be an analysis and critique regarding the implementation of this chapter's theories.

CHAPTER FOUR: SKILLS DEVELOPMENT CENTRES

4.1 INTRODUCTION

This chapter shall explore the background history of skills development centres and assess the current approach towards their designs to analyse where it falls short in being inclusive for the visually impaired. It will also hone in on the significance of Skills development in a south African role and how it plays a critical role in mending issues linked to the nation's history. These will be assessed to review the effectiveness of the Skills Development facilities in responding to the needs of visually impaired people.

4.2 SKILLS DEVELOPMENT IN SOUTH AFRICA

Coming from the history of Apartheid, where the country's population was segregated across racial lines, economically, and in other areas, the democratic government of 1994 set out with a goal to repair the lack of opportunity that previously disadvantaged communities experienced as a result of this. (Letsaka, 2004) The most affected within these communities were often the women and people living with disabilities. Furthermore, it was argued by the post-apartheid government that one of the areas to be addressed in fixing the inequality was the underdeveloped infrastructure of the nation to create an equally prosperous future for all. (Letsaka, 2004) This mission made skills development facilities a vital tool for this goal to be a reality in the lives of citizens to break free from the legacy of the apartheid regime that contributed to a lot of inequality, unemployment and poverty.

The attitude behind Skills Development Centres was also to enable more citizens to have a better quality of life through participation in the economic arena. This inclusivity into the labour force would also facilitate more sustainable living for the beneficiaries of Skills Development (Lestaka, 2004) as they could provide for themselves through employment or independent trade. The Department of Higher Education and Training (2015) set out on the National Skills and Development Strategy III, which had a mission of “*Increasing access to High Quality and relevant education, training and skills development opportunities...to enable effective participation in the economy and society by all South Africans and reduce inequalities.*”(DHET, 2015:4) Furthermore, the organisation conceded that there were still large territories that needed to be covered to increase skills development opportunities for people with disabilities, and the insufficiency of skills development was a significant barrier for them to obtain employment participation. (DHET, 2015)

4.3 SKILLS DEVELOPMENT CENTRES

Skills Development Centres as training facilities have many similarities to other learning spaces, with a critical focus of the buildings being on facilitating teaching and acquisition of knowledge through impartation for the learners. They serve as crucial vehicles in addressing the issue of unemployment through hosting facilities where people can be empowered with skills that can enable them to participate in the economic sector. Due to their vital role in empowering people, they must create a conducive environment for the learners to have an unhindered experience in their quest for learning. Thus the quality of the relationship between people and the spaces where they learn and produce their craft or skill also has a direct bearing on people's creativity (Moehring, 2013) and, in some cases, their enthusiasm towards the craft itself. This effect highlights the direct relationship between people, space and the rendering of skills through environmental support.

For public learning spaces such as Skills Development Centres, a person's relationship with space is not the only important element of them but also the way that spaces endorse communal gathering amongst people to boost social interaction amongst one another. (Barrett, 2018) These learning spaces are often viewed as responsible for promoting interaction and forming a community, which takes their responsibility beyond a mono-centric approach but rather one that is inclusive for all users. This has often been the approach towards learning spaces such as Skills Development Centers, which has had benefits in creating a system that allows for an exchange of ideas and knowledge for the users (Barrett, 2018) through formal and informal learning engagement.

Integrating different kinds of people through space not only improves social interaction among people but also assists in making the built environment more inclusive and accessible. Since such spaces are designed to host previously disenfranchised people, it becomes vital that they do not segregate or isolate people and further entrench barriers to equal experience and opportunity. This means that skills development centres also have to have an inclusive approach for people living with disabilities and, more specifically, visual impairment. There has been insufficient coverage of how skills development centres can be more inclusive for the visually impaired through design and thus still exclude them in the economic arena, highlighted by the high unemployment amongst the visually impaired.

The design approaches of many skills development centres in the context of South Africa unintentionally exclude visually impaired people unaware by absorbing them into a skills

development centre for the blind only but omit to integrate them into the same facilities as other people in the greater society in need of skills development. This has often had a negative impact on the inclusion of the visually impaired in the economy. The few skills development centres catering to the visually impaired become easily overwhelmed in dealing with the volume of people with visual impairment. In order to facilitate more seamless inclusion and skills development, the facilities that are not catering for the visually impaired only need to be more inclusive to allow for a mixture of both and an inclusive approach to skills development.

4.4 CONCLUSION

Reflecting on the background of skills development in South Africa and the spatial needs of the learning spaces, it is clear that there is much ground to cover in including economic empowerment for the visually impaired. These facilities have helped equip many people with skills to participate in the economic sector, but the building's design approaches have upheld barriers for the visually impaired. The ocular-centric approach has created spaces for the visually impaired to be isolated and has not created spaces where they can comfortably learn skills and be included alongside other citizens to create a cohesive society. Their inclusivity within the greater society requires that spaces such as learning spaces be inclusive of them and their needs.

CHAPTER FIVE: PRECEDENT STUDY

5.1 INTRODUCTION

This chapter will review and offer an analysis of existing buildings that not only cater for the visually impaired but also do so under the framework of the literature that has been explored. The rationale behind selecting these precedents was to better understand multi-sensory responses to visual impairment and how the approach aids perception and creates a stronger link between the visually impaired and the built environment. International precedents were selected to get a broader understanding of responses from different regions of the globe. The principles used in their design approaches will also inform the kind of facilities and room schedules implemented in the design project.

5.2 CENTRE FOR THE BLIND AND VISUALLY IMPAIRED, MEXICO - TALLER DE ARQUITECTURA-MAURICIO ROCHA ARCHITECTS

5.2.1 BACKGROUND

Location: Av Telecomunicaciones, Chinam Pac de Juárez, Iztapalapa, 09208 Ciudad de México, CDMX, Mexico

Architect: Taller de Arquitectura-Mauricio Rocha

Year of project: 2001

Built Form Typology: Community Centre

Total Area: 14 000m²



Figure 5.1 indicates the location of the centre for the blind (Source: Google Maps, n.d.)

Built in 2001, the 14000sqm complex located in Mexico City (Fig 5.1) aims to meet the needs and requirements of visually impaired people. Being in the heart of New Mexico, Mexico City, the Centre was designed to accommodate visually sighted and non-sighted people. Mauricio Rocha architects' requirements included offices, a Cafeteria, Workshops, Shops, Braille and Sound Library, A plaza, Classrooms and private gardens.

5.2.2 JUSTIFICATION FOR PRECEDENT

This precedent is relevant for this study because it offers a multi-sensorial response to visual impairment and has the same typology of a skills development centre. It responds to visual impairment through multi-sensory stimulative design and factors in the element of place within it for visually impaired people. It is also located in a busy city centre, a context similar to the site of this research's urban fabric.

Mauricio's design factors in the phenomenological experience of dwelling in space. It views multi-sensory stimulation as more than a navigation tool and as an asset in building solid relationships between people and the space they inhabit. This breaks away from an Ocularcentric design as the building is not tailored for a visually dominant experience. Although they have not perpetuated an ocular-centric approach, they do not sacrifice the appearance of the built form and still curate the design according to the client's desire.

5.2.3 MULTI-SENSORY DESIGN

The building makes good use of a multi-sensory stimulative design approach. The Spaces are not limited to visual interpretation alone but also are inclusive in alternative ways for visually impaired people.

The use of different materials helps read the spaces in and around the building. The external walls have a concrete and face-brick mix splitting at hand height, as demonstrated in Figure 5.2, which visually impaired users can use to feel their way around the building. The floors have also used different materials in the spatial demarcation and for communicating information regarding the space. The

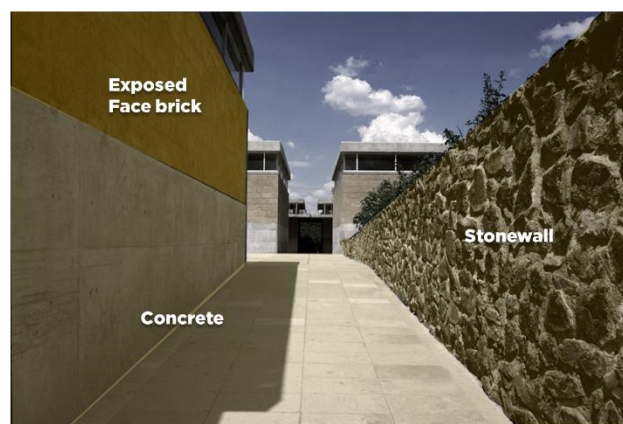


Figure 5.2 highlights the different materials that are used throughout the surfaces of the complex to evoke haptic stimulation. (Source: Gordoia 2011. Adapted by Author, 2022)

materials in the garden use different textures for orientation and perception. The courtyard uses the pebblestone recess in the floor to demarcate the water trough running through the centre of the courtyard. This tool is effective in communicating the spatial characteristics of the courtyard without the use of sight.

5.2.4 PHENOMENOLOGY

Other senses beyond sight and haptic sense are used and incorporated into the design of the complex, as shown in Figure 5.3. The courtyard has a water trough separating the space in half. The sound of the water trickling through the space can help visually impaired people perceive the space and the presence of a body of water that exists. This helps with their spatial understanding and formulating a picture in their minds of the space. The rhythm of the water, which is not as loud as a larger body of water, also gives an idea of the magnitude and scale of the trough. This is done through the noise and repetition of the trickling water.

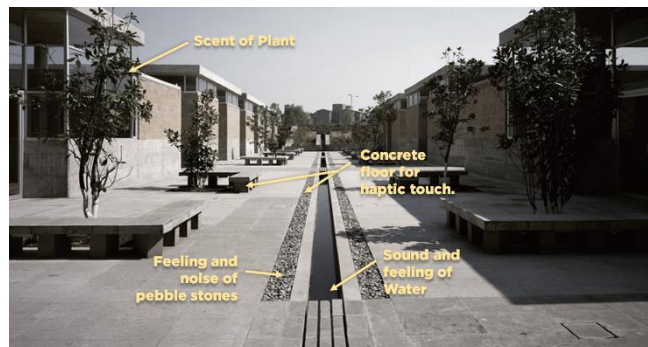


Figure 5.3 highlights the different tactics that the Centre for the blind implements to adopt a multi-sensorial approach (Source: Gordoa, 2011. Adapted by Author, 2022)

The complex also uses the implementation of a stone-cladding boundary wall as a noise diffuser for the auditory atmosphere coming from outside of the site that could tamper with the perception of other elements. This strengthens the ability to identify and perceive the surrounding environment for the visually impaired as stimulations are not overpowered by other stimulations (foreign to the site) coming from the busy streets of New Mexico.

Another sense that is used to form perception is the scent of the plants in the seating areas. Whilst they can be touched and felt, they can also be smelt. This form of perception allows users to be stimulated scentually, along with any memories that they might have of the scent of the plant. The odours of the plants also define the outdoor courtyard area and make it easier for people without vision to orientate themselves.

Perception also happens through reading light and darkness, warmth and coolness. In Figure 5.4, the corridors use a mix of cantilevered concrete planes to create pockets where light penetrates through and parts that are blocked off by the concrete slabs.

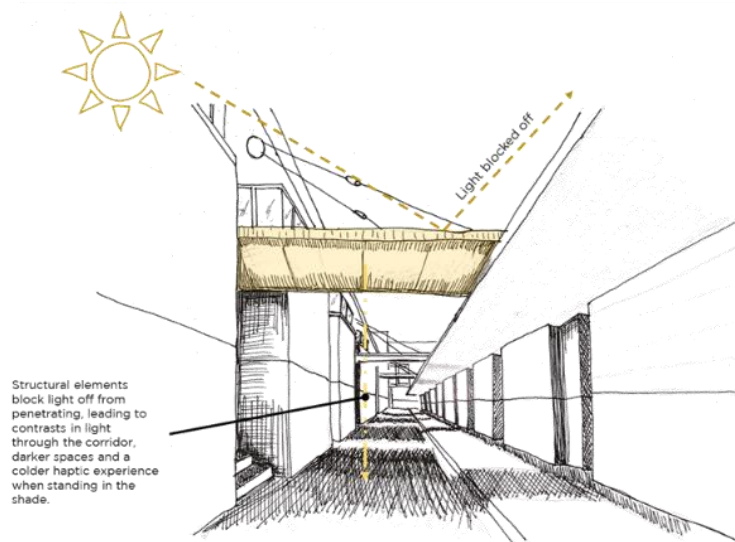


Figure 5.4 The built environment responds to the elements and uses them in improving the spatial perception of visually impaired people in space (Source: Gordoa, 2011. Adapted by Author, 2022)

The disparities between areas with the warmth of the light in them and those without indicate the structural conditions of the area, as those cooler parts have planes blocking the warmth of the sun.

5.2.5 PLACE

The design and construction of the complex achieve a sense of place for the visually impaired through various methods and means. The building is perceivable to people with visual impairment, which helps with allowing them to feel connected to the environment they are around. The complex's design facilitates not only one sensorial stimulation but multiple and a wide variety of them. This allows users of the space to feel connected and unified with the space as most properties of it are recognisable to the visually impaired. Such care and intricacy in the design also allow the environment's spatial characteristics to be represented beyond the sense of sight. Being able to interpret the environment leads to freedom within the space as it is understandable, and visually impaired people can dwell in peace in the environment.

5.2.6 BUILDING PROGRAM

The spatial organisation within the building is aligned towards a grid that makes it easier to navigate and orient visually impaired users around the complex, as represented in Figure 5.5. The various rooms and spaces are easily located as the grid design of the corridors makes it easier to track which block of building the visually impaired users find themselves in. The usage of the changes in height through staircases along the corridor also makes the perception of the building layout more effortless and can assist with orientation.

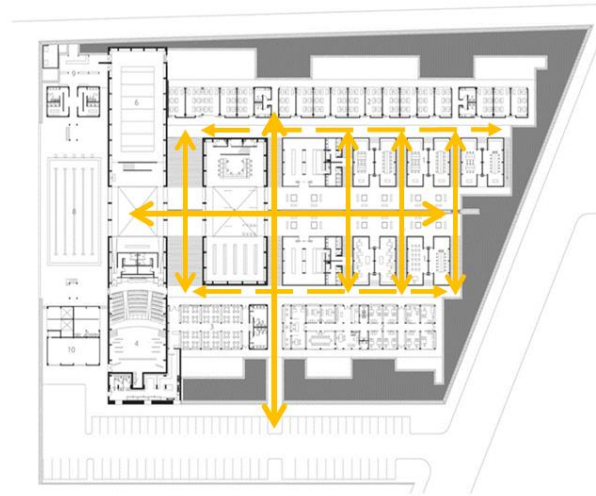


Figure 5.5 depicts the grid layout that Centre for the Blind uses for easier navigation for visually impaired people (Source: Mauricio Rocha Architects, 2001. Adapted by Author, 2022)

The classroom and teaching rooms have also been built into stand-alone pods to decrease difficulties caused by complicated corridors. This makes it easier to remember where the rooms are and understand the complex's spaces.

5.3 HAZELWOOD SCHOOL, GLASGOW- ALAN DUNLOP ARCHITECTS

Location: 50 Dumbreck Ct, Bellahouston, Glasgow, Scotland

Architect: Alan Dunlop Architects

Year of project: 2007

Built Form Typology: School

Total Area: 2665m²



Figure 5.6 shows the urban layout of Glasgow and the positioning of the Hazelwood school in relation to the urban context. (Source: Google Maps, n.d. Adapted by Author 2022)

5.3.1 INTRODUCTION

The Hazelwood School, situated in a park setting, is an educational institution catering for up to 60 students between the ages of 3 and 19 years Living with disabilities, including visual impairment. The facilities can cater for nursery to high school groups of scholars and cover an area of 2665m². The site is surrounded by a residential area and Park and is not too far off from a major highway that runs to the southwestern parts of Glasgow. This makes the school easily accessible in the city's urban fabric due to its proximity to a variety of major traffic nodes.

5.3.2 JUSTIFICATION FOR THE PRECEDENT

This building is suitable for the research because it not only adopts a multi-sensory approach but also looks at the incorporation of place for visually impaired people. It also has skills

development facilities, making it an ideal building for gaining information. The design of the building also incorporates and carefully considers the phenomenological experience of the visually impaired. It places them at the center of the space and focuses on an environment that is easy to understand and relate with.

5.3.3 MULTI-SENSORY DESIGN

The Hazelwood school uses a variety of materials in its design to help visually impaired students to be able to perceive the space around them. The Haptic sense has been prioritised in selecting materials that cater for the sense of touch, such as the cork cladding in the hallways in Figure 5.7. This is used for navigation as those that are blind can feel their way around the

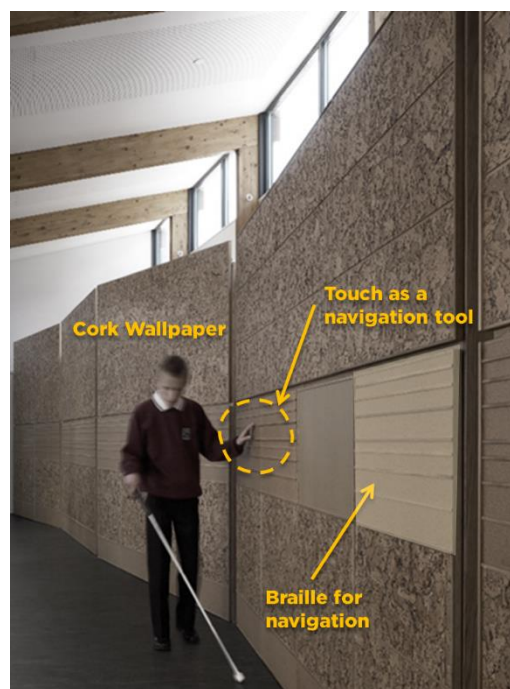


Figure 5.7 Cork wallpaper is combined with braille imprints in assisting the visually impaired students with navigation around the school. (Source: Architizer, n.d.; Adapted by Author, 2022)

space. In the outdoor areas, the pathways also utilise a mixture of tactile materials and multi-sensory tactics, as depicted in Figure 5.8.

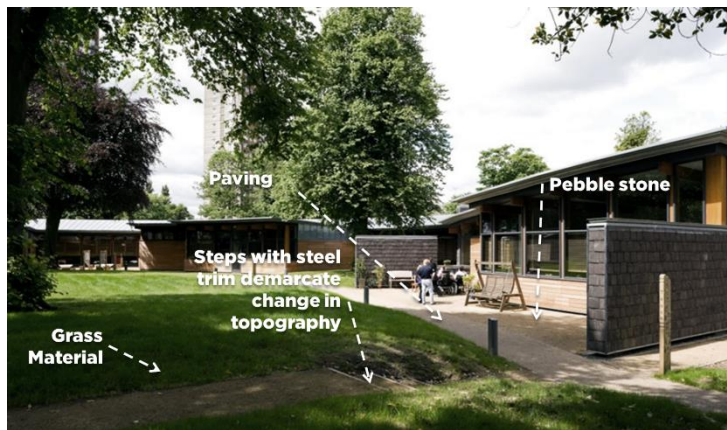


Figure 5.8 The outdoor area of the Hazelwood school uses multiple elements to respond to visual impairment and help students to orientate themselves. (Source: Architizer, n.d.; Adapted by Author, 2022)

The general pathways use a mixture of tarmac and concrete whilst the play area has pebblestone flooring, which has tactile and auditory qualities when engaged in contact. These different elements of the school's design strengthen the understanding that visually impaired people can have of their surroundings.

Another material harnessed in the design is glass in areas such as the hallway. This maximises the amount of light that can be let into the building to illuminate the pathways and create a warmer space. This is achieved through light penetrating and being absorbed by the surfaces. Figure 5.9 illustrates how the contrasts between the materials that allow light to pass and those that do not create a relationship that leads to spatial perception. Tectonics can be interpreted through its presence or lack of light and its haptic qualities.



Figure 5.9 The usage of glass in the hallways allows for light to penetrate into the space and allow for spatial perception for visually impaired people through its contrasts of light and temperature. (Source: Architizer, n.d.; Adapted by Author, 2022)

Colour coding is another tactic the school's design uses to assist visually impaired people in understanding the spatial environment. Figure 5.10 demonstrates how different colours are

used in various ways in the school to aid with forming better perceptions for visually impaired pupils. The implementations vary with the use of colour to highlight points of interest and, in some cases, as a coding tool to indicate certain zones in the building.

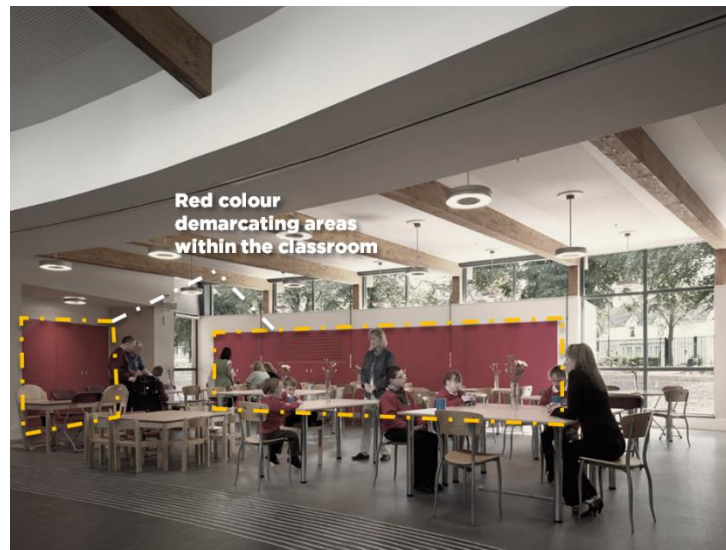


Figure 5.10 Colour is used to highlight fields and zones of interest and the contrasts help differentiate different areas. (Source: Architizer, n.d.; Adapted by Author, 2022)

5.3.4 PHENOMENOLOGY

The school's design uses various methods to stimulate the body's senses to create spatial perception. The use of light, colour, haptic textures and even scent in the landscape are all elements that help visually impaired people perceive the space around them. This awareness of the surrounding elements builds an understanding of their environment and formulates a stronger relationship with the space around them. This moves away from the Ocularcentric approach to architecture and favours the more inclusive multi-sensory approach that gives equal agency across the senses. This enables visually impaired people to perceive the built environment better. The relationship that the different senses have with one another is considered as the elements all coming together to formulate a singular experience for visually impaired people. This demonstrates the principles of Gestalt psychology and the unification of the elements of space in forming a single perception framework.

5.3.5 PLACE

The building uses a few methods to connect to the people and has strong relations with them. Many of the spaces include multi-sensorial stimulative elements, allowing for better

perceptions of the spaces. Examples of these are found in the intimacy the built form has to visually impaired users in how the hallways use cork-cladded walls as haptic navigation tools. This linking through touch brings a strong connection of the built form to the visually impaired user. Another example is how the outdoor spaces harness different materials to bring stronger connections between the landscape and visually impaired users. The playgrounds use grass, tarmac, and pebble stones as different demarcations of zones where the students can play, walk or sit. This strong understanding of the environment not only means that they can understand the spaces but also understand themselves within the spaces and how they can act or respond to the space. This brings in the element of self-understanding and manifestation in space. Universal design tools are not omitted from the design but rather go beyond the standards of accessibility and navigation to incorporate a sense of place through dwelling and creating spatial identity.

5.3.6 BUILDING PROGRAM

The spatial layout of the building makes the navigation of the space easier for Visually impaired people. Although the main corridor curves around the landscape, it is still easy for the learners to find their way around as the corridors are wide enough, and similar activities around the building are grouped in zones, as illustrated in Figure 5.11.

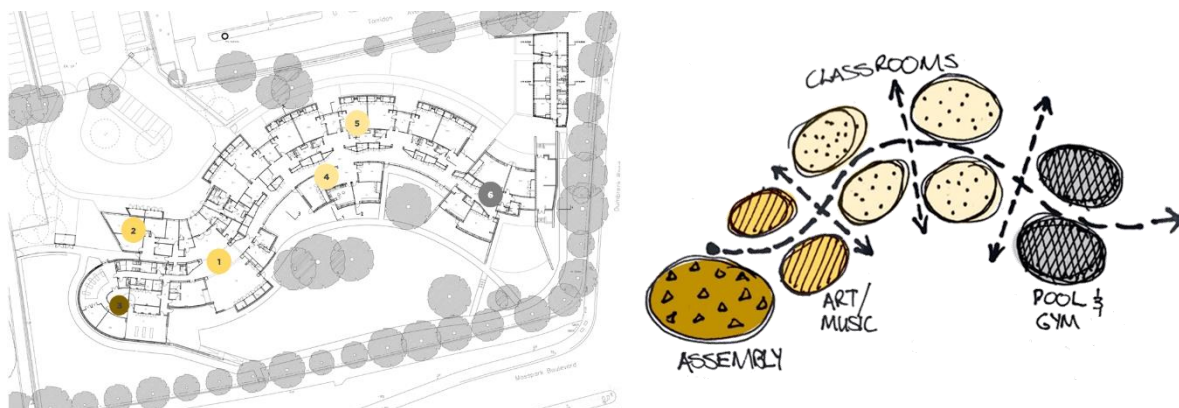


Figure 5.11 The spatial layout of the building uses a curved spine that feeds into all the different rooms in the building. The grouping of similar spaces together also enables a better orientational and navigational experience. (Source: Architizer, n.d.; Adapted by Author, 2022)

This means that the access routes to the various rooms are more straightforward as visually impaired learners do not have to travel from end to end of the school premises regularly each day. This also allows them to memorise their route around the school easier and build their understanding of the space they are around.

5.4 CONCLUSION

Looking at the precedents consulted in this chapter, the common themes are how spatial perception can be strengthened through sensory stimulative elements of a space. The series of these elements included in the design also influences the experience visually impaired people have of the spaces. This helps visually impaired people to be more confident and independent in moving around the spaces and potentially feeling less vulnerable due to a weakened orientation.

Whilst the buildings do not prioritise the sense of sight through an ocular-centric approach, they integrate the other senses in a manner that does not diminish the aesthetic qualities of space. The design responses also consider the interrelationship of the senses since the human body perceives them as a whole rather than independent elements. Each stimulation complements the others in the experiences of the spaces.

The implementation of place theory helps the designs go beyond the Universal Design principles. The way the designs of the spaces are rendered not only looks at the facilitation of movement and orientation but integrates the quality and sense of place. These enhance the value of dwelling and build a stronger relationship between visually impaired people and the built environment. The strengthening of the relationship also helps in representing the character of the spaces in a manner that can be perceived even by the visually impaired, such as the feeling of peace and relaxation in the outdoor recreational and leisure spaces in the precedents consulted.

The precedents explore the possibilities of a multi-sensory design framework and different approaches to responding to visual impairment. These tools offer great navigational devices to perceive the qualities and properties of the space around them. Furthermore, they also factor in the body-centred design approach and cater to visually impaired people to have quality connections to the place and be unified with the environment. In the next chapter, the research will explore skills development centre's approach for visually impaired people through case study analysis. The research will review the effectiveness of the design in terms of wayfinding plus the quality of the relationship between visually impaired people and the building and spaces around them.

CHAPTER SIX: CASE STUDY

6.1 INTRODUCTION

A number of factors need to be considered when a design approach for a facility that is inclusive for the visually impaired is designed. This chapter shall seek to critically analyse the KZN Society for the Blind (KZN-SB) premises to learn from their approach to an inclusive design within the built environment and, more so, a skills development facility.

6.2.1 JUSTIFICATION FOR CASE STUDY

The KZN-SB is an ideal building for this case study due to the inclusive architectural design approach for the visually impaired and has skills development facilities for them. The location of the case study is also found within the same context as the site of this research project's location. The building also happens to be a part of very few public buildings in the context of Durban with architectural design features that respond to visual impairment.

6.2.2 BACKGROUND

Formed in 1919, the KZN-SB has grown to become an organisation that gives a multi-faceted approach to access to human rights-related services for the blind and partially sighted people in the region of Kwa-Zulu Natal. (KZN-SB, n.d.) The organisation's services include Early Childhood Development training, Skills Development such as computer, musical classes, braille, cane weaving, orientation and mobility lessons, optometric medical services, rehabilitation services, residences, and economic and business development skills. (KZN-SB, n.d.)

The success of this organisation and its facilities in building a more inclusive society for the visually impaired culminated in them obtaining recognition from the eThekweni Municipality when they awarded them with a certificate of appreciation at the 9th Living Legends Award Ceremony of the municipality in 2016. (KZN-SB, n.d.)

6.2.3 LOCATION

The KZN-SB is located within the macro context of the coastal urban city of Durban in Kwa-Zulu Natal. The surrounding of the site is dominated by industrial and commercial buildings stretching adjacently along the shore of the Maydon Wharf harbour. It rests at Umbilo and Chestnut Road intersection (Figure 6.1) and is highly accessible through public and private transportation. A train station can also be found a few blocks away, which helps give people who reside further away from the building easier access to the premises. This is not so effective

for the visually impaired as insufficient interventions assist them in efficiently navigating from the station towards the site. There are moderate levels of pedestrian traffic flows along Umbilo road, but other roads around the site are quiet. Due to the high vehicular traffic flow along the node of Umbilo road, the busyness leads to high noise pollution.



Figure 6.1 shows the urban context of the KZN Society for the Blind Premises (Source: Google Maps, 2022)

6.3 MULTI-SENSORY DESIGN

6.3.1 SPATIAL DESIGN

The premises for the KZN-SB is made up of 3 fragmented sites that host the administrative, retail and skills facility in one building, a life skills centre in the other and workshops and



Figure 6.2 depicts the site layout for the KZN Society for the blinds premises and the movement paths around it (Source: Google Maps, 2022)

parking in the last one (Figure 6.2). This fragmented approach is not ideal for navigational purposes, as the spaces are treated differently. Insufficient design responses are made to form linkages between the different buildings through

multi-sensory methods such as textures and walkways, decreasing the perception of the environment for the visually impaired.

The pathways that link the buildings together are also complicated to navigate. The routes feature a few staggers and points of changes in direction in the pathway instead of a simplified connection linking the three buildings together. This does not aid in creating a more effortless navigational experience for the visually impaired and has a complicated route to attempt to memorise. The paths linking the buildings are also exposed to the elements and offer no protection from bad weather conditions. This presents hazardous spaces and does not offer comfort for the visually impaired when navigating the pathways.

Many of the pathways are mono-textured and only transition when moving from indoor to outdoor. The lack of variation makes spatial perception more challenging for the visually impaired. There is an attempt in some areas, such as in Figure 6.3 where the street transitions from concrete paving to asphalt, which is used to demarcate the end of one zone of the street to another, bringing attention to the change in direction at the street corner.

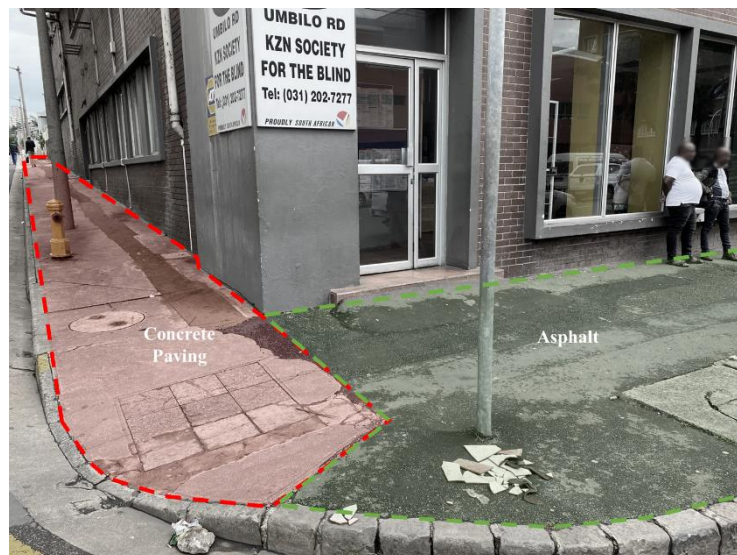


Figure 6.3 illustrates how the transitions in the material on the streets are used to indicate the thresholds and landmarks for changes in direction (Source: Author, 2022)

6.4 UNIVERSAL DESIGN

Accessibility is one of the critical focuses of the KZN-SB's design approach. It seeks to enable visually impaired users of their spaces to navigate their premises easily through a wide variety of tactics deployed to facilitate orientation in spaces. One of the ways that they use when approaching the main entrance of the admin building coming from the street is topographical changes. The region in front of the main door has a small ramp to channel people towards the door and offer a cue of an important landmark the entrance door. At a contextual scale, the

street incorporates braille pads to be inclusive for the visually impaired to be able to navigate the walkways to and around the building (Figure 6.4).

6.4.1 RAMPS



Figure 6.4 shows how Braille pads form part of the contextual interventions that make the building more accessible for the visually impaired when walking to and around the site. (Source: Author, 2022)

Topological variations are another tactic used frequently as a haptic cue of important thresholds in the building. As one enters the main door and proceeds towards the showroom, the floor has a gentle ramp-up to indicate a change of zones (Figure 6.5). In other parts of the buildings, the floors usually have a gentle ramp before the top step on staircases going down (Figure 6.6). This allows for an indication of a potentially hazardous region for the visually impaired users of the building. The visually impaired users are trained to understand this coding language used within the design of the building and yield towards the sides, where they can grab onto the railing or handrail before descending toward the floor below.



Figure 6.5 and 6.6 Show how topographical changes are used as cues on thresholds to communicate about the spatial characteristics in the building. (Source: Author, 2022)

6.4.2 HAND RAILS

The staircases utilise the handrails, which are often used for balance and redefine them as a tool for helping the visually impaired navigate changes in levels. They are designed to stretch from the first step to the last and align with each of them respectively as shown in figure 6.7.



Figure 6.7 illustrates the usage of handrails as a tool to measure the extent of flights of stairs (Source: Author, 2022)

This allows for the handrails to measure the length of the start and finish of the flight of stairs. The visually impaired can quickly ascend or descend the stairs by holding onto the handrails. Unfortunately, the staircases do not have nose trims that are a different texture to indicate that

the staircase is about to start, as is the standard according to the SANS 10400–Part S documentation for staircases (National Building Regulations South Africa:2011). Although it was primarily designed for extra grip when commuting through staircases, it also creates a threshold for the visually impaired. Many of the users of the building who are visually impaired use the tool of caressing their hands against the wall to feel their way around the building haptically. The wall corner before the stairs is rounded instead of having a sharp rectilinear corner so that those moving around the building can identify a cue for a change and transition within the building.

6.4.3 TEXTURES

The building utilises various textures in defining certain zones and spaces and their transitioning. This enables easier identification of where specific spaces start, and others begin. Although this is a good tactic in helping the visually impaired to be able to perceive the environment around them, in some places, the haptic variation in the patterns of the textures of the tiles is not significant enough to recognise differences between them. This is due to tile shapes, sizes and textures being very similar, as indicated in figure 6.8. The variation is



Figure 6.8 depicts the change in texture that has similar properties and therefore does not offer much clarity on the differences for the visually impaired. (Source: Author, 2022)

primarily identified in the colours of the tiles, which do not offer much assistance for those with greater difficulty with visual impairment. In the building's clinic and rehabilitation offices

the carpet flooring offers a great deal of variation to the tiled floors in the main passages and helps to indicate a different spatial zone in the building as illustrated on Figure 6.9.



Figure 6.9 The clinic spaces utilize different flooring material to that found in the buildings haalways to signify a difference in the two spaces for the visually impaired. This material is then also used to code the clinic spaces throught the building. (Source: Author, 2022)

6.4.4 BRAILLE SIGNAGE

Furthermore, to assist those visually impaired in identifying some of the rooms, the organisation has also gone as far as adding braille signage on the doors just above the door handles to assist in identifying rooms (Figure 6.10). This signage helps the visually impaired in identifying spaces such as offices and also being able to differentiate between ablutions for males and ablutions for females and classroom areas where they are taught.



Figure 6.10 indicates how braille signage is used as a tool of communication and identification of spaces. (Source: Author, 2022)

6.4.5 LIGHT

Light and shadows are key tools that are used in helping the visually impaired understand the space around them. The showroom has large openings facing the street that allow light to enter and naturally illuminate the space. As one travels further into the building, the reliance on artificial light increases as many spaces are shielded from receiving natural light. The lights are not used as tools to bring attention to any fields of interest but rather as tools to omit radial

light. Some places are not well-lit, such as transitional passages but spaces of arrival, such as the reception desk, are well-lit to bring some focus to the reception desk.

6.4.6 COLOUR

The central natural light openings of the showroom are covered and painted in a variety of different contrasting colours (Figure 6.11). This allows them to be easily identifiable and define



Figure 6.11 shows how colour is used to highlight and emphasise openings. (Source: Author, 2022)

the zone of which light enters the building. This tactic is not consistent throughout the building even though it would assist in defining entrance places, such as the doors in the skills development training centres and the windows looking towards the corridors. The lack of colour variations between the partitioning walls and these thresholds as shown in Figure 6.12 limit how well the visually impaired can be able to identify features of the space around them.



Figure 6.12 shows how monotone colour surfaces make it more difficult for the visually impaired to spot the fields of interests such as doors on the walls. (Source: Author, 2022)

6.5 PHENOMENOLOGY

The building has multiple ways in which it attempts to cater to the experience of the visually impaired in how it is designed. The literature reviewed earlier in this research highlighted how experience is built from perception through sensory stimulation and how one has resonance with the space around them. When looking at an overview of the spaces, the building attempts to achieve this through how it facilitates a multi-sensorial design approach that enables the visually impaired to be sensorily stimulated in various ways depending on their orientation around the space. These stimulations bring about self-consciousness of the people in space and can develop psychological resonance and understanding of their positioning in space. Both parties can interrelate through this perception of self that arises from the experience of the environment. The users of space understand more clearly how to respond to different spaces and situations they encounter due to having a strengthened understanding of it and can self-express their desires.

6.6 PLACE THEORY

Connectivity to space is one of the most critical elements of place theory, and this is evident in how the space is built. The character of the spaces is designed to be experienced in multiple ways that connect to those visually impaired. The classrooms have a diverse range of sensorily stimulative characteristics that formulate the spirit of place. The learning space is not just a

place where information is communicated verbally, but the aroma from spaces around the classroom, such as the kitchen, also permeates and contributes to the character of the classroom. In the courtyard garden, the soft texture of the grass contributes to the feeling of a space for leisure and recreation where users can be free to relax and partake in social engagements with others in the space that is free to do so. The Skills Development Centre, where cane weaving is made, connects users through a multiplicity of different sensorial stimulations such as the cold temperature of the screeded floor, noises of the people working and sanding the produce, light entering the facility and the scent of the painting room where furniture is treated with CHEMICALS TO MAKE IT MORE DURABLE AS DEPICTED ON FIGURE 6.13.



Figure 6.13 The painting room has a strong scent from the chemicals used to treat furniture and accessories produced in the workshop. (Source: Author, 2022)

6.7 SKILLS DEVELOPMENT

The Premises has a diverse range of Skills Development from theory-related skills such as computer training, braille learning, and writing to more practical related skills such as cane weaving and music production. This diverse range of skills allows the visually impaired to be catered for better within the premises.

The teaching areas for the theoretically related classes are found on the third floor of the admin block, which allows it to be kept away from the noise and scent-pollutive environment of the workshops and musical studios. This enables students to have greater concentration when studying and not be distracted by external influences that are not related to the activity of learning. The classrooms are built-in internal cubicles with walls not built to reach the ceiling for ventilation purposes. This succeeds in allowing the classrooms to be naturally ventilated but also leaves the rooms exposed to external noise coming from the corridors, which poses a problem for the learners. The classrooms are next to a kitchen cooking area that emits the aroma of food being prepared for the learners, and due to the proximity of the classes, it helps give a clue for the visually impaired to orientate themselves around the aromatic stimulation that they receive in the hallway.

The workshop spaces cater for Cane weaving training and production. The learners and employees who work in the workshop are visually impaired, and the space has an open floor plan to remove obstructions in the layout. The space is further broken up into steel cubical pods that allow for easier collaborative working where the cubical partitions do not offer a barrier to the users of the space being able to communicate with one another. The pods are aligned according to a rectangular grid layout, allowing more straightforward navigation around the spaces for the visually impaired to find their way around. The workshop area is completed and complimented by the painting room, where the produced furniture goes through its last cycle of production before moving to the showroom to be sold(Figure 6.14).



Figure 6.14 Shows a typical working pod station and the general open area (Source: Author, 2022)

6.8 MEMORY

As part of the Skills Development and training that the facilities offer, it also helps the visually impaired adjust to a new way of life by training them in identifying the hapticity of different floor textures. This helps them program and record textures usually found within the built environment. This can be seen in figure 6.15 in how different tiles and finishes are used in the pathway leading to the learning spaces, which is a high-traffic route to help the visually impaired accustom themselves to different texture conditions. This storage of information in



Figure 6.15 depicts how different textures are used in the pathway to help acclimatise visually impaired people with different kinds of textures to enable them to use this record to easily identify different textures in the built environment (Source: Author, 2022)

their memory assists them in obtaining a better understanding of other spatial environments, even away from the KZN-SB's facilities. This improves visually impaired people's experience in relating to the built environment. They can quickly orientate themselves due to the consciousness of various textures. This is important in enabling them to seamlessly engage with spaces no matter where they are, as they can easily recognise different textures.

6.9 CONCLUSION

In the analysis and exploration undertaken in this chapter, looking at the KZN-SB's design approach, it is evident that the centre's designers have attempted to adapt their spaces to respond to visual impairment and the needs of those living with it. Whilst they have multiple ways that this is achieved, there are still quite a few areas where the design of the building and its spaces fall short in facilitating a better relationship between visually impaired people and the built environment. This highlights the shortfalls of the current architectural design approach in creating a more inclusive design approach in the built environment. The KZN-SB premises highlights these manifestations in Skills Development Centers and indicates where further focus still has to be refined. They factor in the experiential relationship of engaging with the spaces through sensory stimulations and prioritise connections to the visually impaired to the spaces, creating a sense of place within the environment.

Another one of the successful methods that the design of the building uses to respond to visual impairment is the Universal design tools such as different materials and topographical changes to enable better spatial understanding for the users of the buildings. These work successfully in enabling those that are visually impaired to be able to use and understand the environment around them. This helps remove barriers within the design so that visually impaired people can experience spaces just as well as those with the sense of sight.

When looking at skills development centres, it was also evident that there is a high importance on how the spaces are allocated in relation to one another and how having a simplified floor layout is beneficial to the visually impaired being able to navigate around the spaces easily without much difficulty. The sensory stimulations that the properties of spaces give are also crucial in informing users about the place's scale, function, location and characteristics. The elements of design where sufficient design tools are used in response to visual impairment make skills development centres more responsive to the challenges for those without sight. The elements discussed that do not sufficiently respond to visual impairment also help highlight where the potential for architecture to do more lies and indicate where more intentional design response is needed.

CHAPTER SEVEN: ANALYSIS AND DISCUSSION

7.1 INTRODUCTION

This chapter aims to analyse and discuss the secondary and primary data collected in the previous chapters of this research. The goal will be to analyse their relationship and extract themes and similarities. The secondary data will be formulated by the theoretical and conceptual discourse from the literature reviewed and precedent studies conducted. The primary data, on the other hand, was gathered through the case study conducted at the KZN Society for the Blind.

The case study is a prominent building for the visually impaired in the context of Durban, as it is one of the very few public buildings with extensive features and facilities to accommodate those who are visually impaired. It promotes the inclusivity of alternative senses in the built environment and provides some useful strategies to achieve spaces that the visually impaired can relate to. While this facility does a lot to try and create a building that is inclusive for the visually impaired, it also has some parts where the design is not too friendly for them, such as the spatial layout and relationships between crucial functions in the premises. Unfortunately, Interviews could not be conducted with the key informants within the duration of this research.

7.2 SENSORY STIMULATION

When looking at primary and secondary data collected and consulted through this research, the stimulation of the senses is one of the most critical themes in any attempt to enable the built environment to respond to visual impairment. Sensory stimulation is the foundation of establishing a design response that can allow visually impaired people to perceive the environment around them.

The theories and concepts mentioned in the literature review all rely on stimulating the body's senses to develop a spatial perception or experience of the environment, as depicted in Figure 7.1. No matter the nature of the theory, it cannot achieve the goal of being inclusive and responding to cater for the visually impaired without first relating to the human body's senses

as shown on Figure 7.2. Even the function of psychological memory to perceive space and create resonance with it relies on the backdrop of sensory stimulation to help the body

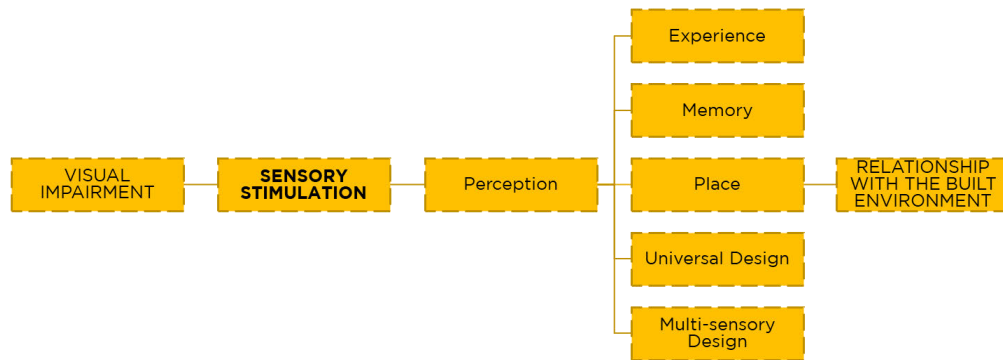


Figure 7.2 shows the importance of sensory stimulation in the process of connecting the built environment to visually impaired people. (Source: Author, 2023)

recognize the characteristics of elements in the environment surrounding them.

The more that design approaches focus on how buildings cater to the alternative senses will help lead to better experiences for visually impaired people in the built environment. Both precedent studies showed how integrating the body's senses beyond the visual sense within design contributes to a higher spatial understanding and better experience for the visually impaired. This theme was also continued throughout the case study. The KZN-SB had a variety of different and unique ways in which the design of their facilities cater for the visually impaired through a strong focus and investment in design orientated towards the stimulation of the senses.

Looking at all of the data collected and consulted within this research, the theme of sensory stimulation has been vital as a spine that connects and brings together all of the data and creates a platform for all the theoretical findings and objectives to be achieved.

7.3 INCLUSIVITY

The purpose of an inclusive design approach is so that no person gets excluded from being able to relate to the characteristics and experience of a space. This is paramount in the built environment to integrate visually impaired people, who have not always been able to have a strong relationship with the built environment due to its exclusive and visual-centric approach.

This theme of inclusivity was a common thread amongst the literature, precedents and case studies consulted within this research. When assessing the theories' relationships, there were common overlaps around inclusivity in the built environments design approach. The process is initiated with the sensory stimulations activated through a multi-sensory universal design. The

stimulation leads to connectivity to the space, which is highlighted by Place theory. Furthermore, the process consolidates on forming a spatial perception which governs the experience of the built environment for the visually impaired.

The buildings explored through precedent and case studies continue with the expression of these theories connected through inclusivity. The buildings show this theme in various ways beyond the framework of the theories and concepts. For example, the precedent of the Hazelwood School for the Blind in Chapter 5.3 shows how an inclusive approach can be expressed not only in multi-sensory design but also the accessibility of the site of the school in the urban landscape due to its easy access from the main highway. This helps the building to be inclusive to more people and users in the population of the surrounding communities and also serves more people beyond the immediate context. The case study also shows inclusivity through how the theories and concepts are used within the premises of the KZN-SB to help connect visually impaired users to the spaces around them and also facilitate for them to experience the built environment through their design. The findings of the theme of inclusivity revealed how it also takes on different meanings at different scales in responding to visual impairment, as indicated in Figure 7.3.



Figure 7.3 reveal the different manifestations of inclusivity of visual impairment in the built environment. (Source: Author, 2023)

Analysing the primary and secondary data collected from the various research tools, the importance of inclusivity in the relationship between the built environment and visual impairment is quite clear. A relationship between these two variables cannot exist without inclusivity being present.

7.4 UNIFICATION

Another theme within the research was unification. It was prevalent in the framework of phenomenology and the theory of Gestalt psychology, which looks at the unification of different elements to be perceived by the human body as a whole rather than segregated bits. Furthermore to these, the theory of place also exhibited principles from the theme of place theory through how the body can have a solid connection to the built environment through dwelling and consciousness of the characteristics of the environment. The intimacy of this relationship between the user and space unifies the body and the spirit of the area that it is immersed in by unifying it with the space.

This also came through strongly in the precedent studies, as the designs showed careful consideration of different sensory stimulative elements used in different spaces on the sites. For instance, in spaces such as recreational courtyards, the integration of plants, streams of water, and natural light from the sun all worked together to create a spatial identity of relaxation space. This consideration and sensitivity for how the senses relate to one another are essential in the perception of space and are vital when understanding how the body combines these elements and sees them as a unified whole with the space rather than isolated parts.

The theme of unification is also seen in the inter-relationship between the layout of spaces in the buildings, as those with similar functions are grouped to form connections. This was deployed to facilitate more straightforward navigation around the premises but also helped unite spaces that host similar activities through connectivity within their proximity, as seen in Figure 7.4. The case study did not show similar levels of consideration for the interrelationship

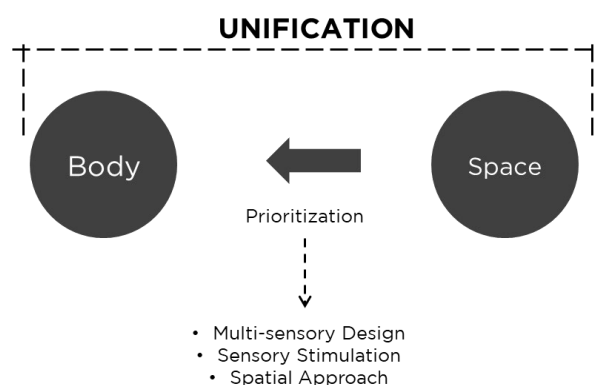


Figure 7.4 indicates how the process of unification of the body and space is accomplished. (Source: Author, 2023)

between spaces that the precedent studies showed, which highlighted room for further focus on multi-sensory design in the context of this study.

All of these different forms of data collected endorse the importance of unification in the attempt to make the built environment more relatable for the visually impaired through different methods and scales.

7.5 CONCLUSION

Looking at the secondary and primary data collected within this research, it is clear that the themes that were present throughout this research and highlighted through analysis how they play a vital role in connecting all of the findings in order for the built environment to be able to be inclusive to the visually impaired. While the themes may differ in some ways and be comprised of different characteristics, they also connect and play a joint collaborative role in making the built environment more responsive to visual impairment, as indicated in Figure 7.5.



Figure 7.5 summarises the themes' roles in connecting the body to the built environment. (Source: Author, 2023)

They all serve as key ingredients that should be integrated within the design process so that architecture moves away from being ocular-centric and improves connectivity to the other senses.

The following chapter shall conclude the first part of this dissertation and offer design recommendations in reflection on the contents provided in this research. It will also inform the design approach towards the selected typology of this dissertation.

CHAPTER EIGHT: CONCLUSION AND RECOMMENDATIONS

8.1 INTRODUCTION

This research aimed to explore how the Built environment can respond to visually impaired people needing skills development and the phenomena of visual impairment through architecture. Another one of the aims was to explore how the relationship between architecture and the senses can be improved overall to be more inclusive of alternative senses beyond sight.

A wide range of research methods and tools have been utilised to understand the critical research questions and, primarily, the effect visual impairment has on architecture and its perception. All the information gathered was focused on answering the research questions and achieving the objectives through theories and concepts, literature, precedents and case study. They will be reviewed and concluded in this chapter, and interpretation of the information gathered shall be given through recommendations.

8.2 CONCLUSIONS

Coming from the background research in Chapter 1, it was clear that the lack of inclusive architectural design in the built environment has had a grossly negative effect on the quality of life that visually impaired people have in society. The adverse effects and problems highlighted the need for skills development to respond to the socio-economic challenges faced by visually impaired people.

When reviewing the research in Chapter 2, the focus of the exploration was driven by the questions of analysing the relationship between visual impairment and spatial perception and the role memory played in spatial perception and wayfinding. One of the key problems that were highlighted was the issue of isolation within the built environment, where spaces do not cater to the senses that the visually impaired can utilise. A response to this is achieved through sensorial stimulative design approaches where perception can be formulated through alternative senses. The sensory stimulation leads to the first theory covered in the literature review, Phenomenology, which emphasises the importance of experience in the relationship between the visually impaired and the built environment. It explored how experience is not only about perception of the elements of the environment, or environment as a whole, but also about self-consciousness and perception. The theory of ocular-centrism highlighted how privileged the sense of sight has become in architecture and the need to incorporate multi-sensory design to improve visually impaired people's perceptions of the built environment. With all the different stimulations that may arise, the theory of Gestalt psychology also showed

how the human brain seeks the simplest unified expressions of things rather than as separate elements.

Furthermore, the literature also explored the role of memory in spatial perception and wayfinding. This revealed how memory contributes to the consciousness of the environment through sensory stimulations that form linkages to encounters from the past. The resonance to the past or what is familiar strengthens the relationship between the visually impaired and the built environment. The findings within this chapter contributed to answering the research questions: What is the relationship between visual impairment and spatial perception, and What is the role of memory in spatial perception and wayfinding?

In Chapter 3, the focus of the first part of the literature review was on responding to the questions of how spatial character can be experienced through the non-visual senses. The theory of Place was explored in response to this, and the common theme was the importance of connectivity and identity with space. It looked at the importance of the body and self-consciousness within space. These were formulated through sensory stimulations that help the space to create a connection to the body. The stronger the identification and resonance of the body and space, through sensory stimulations, allows for it to experience the character of the space around it and achieve a sense of place. These findings all help to answer the research question.

The second part of the literature review in Chapter 3 focused on understanding and responding to the problem of isolation between the built environment and visually impaired people. The effects of the built environment and perception were explored through Multi-sensory design framework, which assumes critical responsibility in responding to visual impairment. The Multi-sensory design framework assists in understanding how design can cater accordingly to the alternate senses that the visually impaired can be able to use. The analysis of Universal Design theory also uncovered how the built environment, through this theory, has not been sufficiently effective in creating an adequately inclusive multi-sensory approach within architecture for the visually impaired. Whilst the principles help to facilitate perception, orientation and navigation around space, they often overlook the importance of a sense of place and contextualising guidelines to suit skills development facilities. The findings of this exploration contributed to answering the research question: What are the effects of the built environment on the human sensory experience?

In the fourth chapter, a brief overview of the approach and needs of skills development centres was done to understand the typology further. Analysing this also enabled a more precise definition of where the typologies are falling short in their inclusion of the visually impaired and where more focus is needed.

In Chapter 5 of the research, The precedent studies of the Centre for the Blind and Visually Impaired and Hazelwood School both assisted in contextualising the literature consulted in this research. The buildings combined the literature-reviewed findings and expressed some design principles that can inform a multi-sensory design approach. They expressed how multi-sensory design can be utilised as a tool for spatial expression to improve the perception of the built environment for the visually impaired. They also expressed how the quality of connections and dwelling can be achieved through alternative senses for the visually impaired. Since the research was contextualised to existing spaces, they also revealed the importance of how spatial layouts should be approached and the vitality of simplified layouts to enable better navigation and perception of the environment. These finding all assisted in obtaining a better understanding of

The case study undertaken at the KZN Society for the Blind, covered in Chapter 6 of the research, continued in contextualising the literature into the built form. This time the building was located within the same context as the location of this study. This facility, primarily a skills development centre for the visually impaired, showed how attempts had been made to create a more inclusive built environment for the visually impaired. The premises use multiple ways for the building to attempt to adhere to universal design standards, which offer some interesting approaches, although there still lies some uncovered terrain in attaining a high level of satisfaction in the design. The findings of the exploration and analysis of Chapters 4, 5 and 6 assisted in answering the research question: What architectural design principles can inform a multi-sensory design approach suitable for the visually impaired in the context of a skills development centre.

Chapter 7 combined all of the findings from each research question and gave an analytical overview of the themes found in the primary and secondary data gathered throughout this research. The themes assisted in giving an interpretive understanding of the finding of the research.

8.3 RECOMMENDATIONS

This research aimed to explore how built form and architecture can be more responsive to visually impaired people needing skills development facilities and how visually impaired people relate to place. This objective led to the decision to conduct the exploration through the typology of skills development centres which formulated the backdrop for the studies undertaken. This kind of building shows the potential that architecture has to be inclusive of the visually impaired through design that focuses on alternative senses and quality connections and experiences. Since the designs are a response to visual impairment, a multi-sensory approach becomes paramount to enable and facilitate for visually impaired people to have a relationship with the built environment around them. The strengthening of the bond between these two parties enables better integration for visually impaired people due to barriers that kept them isolated from the environment around them being removed and enables more independency when navigating around spaces.

Whilst multi-sensory design is beneficial, it cannot be limited to being focused only on facilitating movement and orientation. The design approach needs to consider other factors, such as the character of the spaces, to create a spatial identity for each part of the building or site. This also allows for easier spatial Identification and recognition, which improves the spatial perception of the visually impaired. The visual-biased culture found in ocular-centrism does not mean that aesthetics and the visual qualities of any building ought to be discarded, but rather, the alternative senses need to be given equivalent focus as the sense of sight is usually given. This improves the overall quality of the buildings in society and allows for easier perception no matter which building people with visual impairment may find themselves in.

When looking at the spatial layouts of buildings that cater to the visually impaired, a critical theme was the importance of a simplified spatial layout. This limitation of choices allows for a more effortless navigational experience that a more straightforward spatial plan will enable. Furthermore, the building program should also attempt to group similar spaces as much as possible. Grouping these similar spaces creates shorter distances for visually impaired people to travel within buildings. The core activities of a building need to be easily accessible to them to limit the chances of getting lost when encountering a site for the first time. All of these components combined lead to more independence in moving around the built environment and integration with the greater society due to access to more spaces around them.

The planes and surfaces of space all have the potential to play a role in the experience of the space or place for the visually impaired. Having a sensitivity about the kind of details incorporated into an area's design is vital as any surface encountered has the potential of being a platform of either communication or contributing to the spatial identity. From this perspective, elements explored in this research for a multi-sensory design that contributes to the character of a place, such as materiality, colour, topography, temperature, atmosphere, and lighting, all need to be approached with intention and consciousness in the design process so that the built environment responds better to the human senses. Another critical element is the identification of thresholds and designing around them as they play a vital role in being places of transition which are essential landmarks in spatial consciousness for the visually impaired.

Looking at all that has been covered within this research, the following recommendations will form a framework for the design response to the findings and achieving the aim of being inclusive for the visually impaired:

1. Multi-sensory Design is essential in forming a connection and relationship between visually impaired people and the built environment.
2. The combination of multi-sensory design stimulations should be carefully considered due to its contribution to the identity of a space. Different spaces would be defined differently according to their nature and spatial requirements.
3. The site should not be viewed as an isolated space but as a part of a more extensive network in the context and work in conjunction with other sites.
4. Connection to other key landmark sites for the visually impaired should be made through sensory-activated nodes to assist with navigating between the various sites.
5. The context and immediate surround of the site should be included as a part of the intervention as a final threshold before arrival or departure on the site. The design must also consider how it responds to all the edges around the site and uses the relationship to include the visually impaired.
6. The site should also relate to the culture of the context and what surrounds it, as it is not an island that works in isolation but merges with other stakeholders.
7. Accessibility to the site at an urban scale is vital for public buildings. The site's locality needs to be easily accessible for the visually impaired through means such as public transport networks.
8. The spatial layout should group spaces that are similar to one another or work together within as close proximity to one another as possible. This makes for a better

navigational experience for visually impaired people as their spaces of interest are not scattered or far apart from each other, which can lead to a more difficult navigational experience.

9. Connectivity between the spaces and forms on a site must also be considered within the design approach, as the relationship between the buildings or spaces contributes to the perception of the site.
10. The layout of movement nodes, such as corridors, should be kept as simple as possible so that it becomes easier to navigate around the site, understand the layout, and orientate around it.
11. The form and orientation of the spaces should respond to the elements such as light and climatic conditions. These contribute to the multi-sensory experience within the spaces, and their inclusion or response is an asset within a design response.
12. Materiality plays a considerable role in spatial design and perception for the visually impaired. The selection of materials and how they are used is critical as they often can relay multiple layers of information such as texture, topography, light penetration or absorption and temperature, amongst other things. Thus, the design approach should carefully consider the choice and implementation of materials.
13. Public buildings such as Skills Development Centres must be inclusive in their design approach to cater to visually impaired and sighted people so that one is not isolated from the other. This enables the greater built environment to be inclusive for all people and better societal cohesion where both parties can have equal access to opportunities, spaces and their experiences.
14. The placement of skills development centres should be central to where there is a concentration of people (specifically visually impaired people) in need of skills development and where there is the opportunity for economic participation and trade once equipped. This increases the site's footprint to have a more significant impact on the urban scale of communities.

Whilst the research covered a vast array of areas concerning the topic and research objectives and questions, there still are areas where further exploration is needed. This includes different building typologies and exploring how visually impaired people can be included better in the urban design of cities. More buildings need to be inclusive for the visually impaired, and their services should not be compartmentalized to just certain buildings or spaces should be inclusive of their needs. Further exploration of the building regulations and how the standards of

expectation for universal design can be upgraded to solidify the inclusivity for visually impaired people is also needed.

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APPENDICES

APPENDIX A - SEMI-STRUCTURED INTERVIEW QUESTIONS – ORGANISATION REPRESENTATIVE

The following is a sample of the interview that will be conducted with the participants. These interview questions are open-ended to allow the participant flexibility in response.

Interview carried out and compiled by Mbuso Mancotywa

Master of Architecture Student at the University of Kwa-Zulu Natal

Student Number - 214531904

PART A

Name(s) of Interviewees: _____

Position(s): _____

Date: _____

PART B

The following questions below are to be asked to a representative of an organisation that works with Visually Impaired people.

1. What are your job/role/duties in this organisation?

2. How many visually impaired people do you cater for within this facility?

3. What is the average time period that a visually impaired person would spend obtaining skills here?

4. What skills do you empower visually impaired people with?

5. What methods do visually impaired people often use to orientate themselves around a space?

6. Of the methods that they use is there one that visually impaired people find best/easiest to orientate themselves around a space?

7. Which senses are visually impaired people most comfortable using to supplement the visual challenge?

8. What elements do they look out for when moving around to help aid navigation?

9. If you could redesign the common dwelling spaces within the facility, how would you change them? What elements would you highlight?

10. How would you improve learning & working spaces for visually impaired people?

11. Does memory have a role to play in how visually impaired people interpret space?

12. Does Visual Impairment affect the emotions of people?

13. Do Blind people find it difficult to live an independent life after visual impairment in the current state of the built environment?

14. Do you feel that the state of the built environment has a role to play in the difficulties of integration of visually impaired in the economic arena?

15. Are more Skills Development centres needed for visually impaired people?

APPENDIX B - CASE STUDY OBSERVATION SCHEDULE

The following is a sample of the features that will be surveyed by Mbuso Mancotywa for the research case study.

Survey conducted by Mbuso Mancotywa

Master of Architecture Student at the University of Kwa-Zulu Natal

Student Number - 214531904

Date: _____

The following features of the building will be surveyed for the case study:

General Information Log for Site Observations			
Site location:		Date:	
		Time:	
Date of building completion:			
Number of Adults:			
Layout of Bulding: <i>Describe form</i>			
Building Program Analysis:			
Building Floor Area:			
Number of Skills Development Facility Areas:			
Size of Skills Development Rooms:			
People per Skills Development Facility:			

Support Areas:	
Outdoor Play Area: <i>Describe space</i>	
Construction / Materials: Floor Walls Ceiling Roof Windows Doors Lighting	
Fittings and Fixtures: <i>Describe</i>	
Universal Design Approach:	
Condition of Building and Site:	
Sketch of plan:	

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Learning Environment Log for Site Observations			
Site location:		Date: Time:	
Pedagogic / Learning Approach:			
Work Area Approach:			
Naturalness: Daylighting Fresh Air Noise(s) Scent Texture Toilets (smells) Connections to nature			
Individualisation: Low space density Scale Personalisation Flexibility Institutional feel Display Navigation			

Response to sensorial pollutants:	
Stimulation: Colours Balance open / private Audio Scent Hapticity Outdoor space Texture Variety in Skills facilities	
Skills Development Spatial Atmosphere:	
Flow between inside and outside:	
Place Identity:	
Connection with Community:	
Relationship with Street/Context	

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Sketches, Photographs and other tools of graphical analysis will also be collected from the survey and also used as tools for gathering information to address the survey interest points.

THE END

APPENDIX C – CONSENT FORM - ORGANISATION REPRESENTATIVE

Informed Consent Document

Dear Participant,

My name is Mbuso Mancotywa (*Student Number: 214531904*). I am a Masters candidate studying at the University of KwaZulu-Natal, Howard College Campus. The title of my research is: **EXPLORING VISUAL IMPAIRMENT THROUGH THE BUILT ENVIRONMENT**; Towards A Multi-Sensory Skills Development Centre in Umbilo, Durban. The aim of the study is to explore how built form and architecture can be more responsive to visually impaired people in need of skills development and how place can be expressed beyond the visual experience. I am interested in interviewing you so as to share your experiences and observations on the subject matter.

Please note that:

- The information that you provide will be used for scholarly research only.
- Your participation is entirely voluntary. You have a choice to participate, not to participate or stop participating in the research. You will not be penalised for taking such an action.
- Your views in this interview will be presented anonymously. Neither your name nor identity will be disclosed in any form in the study.
- The interview will take about 40 min.
- The record as well as other items associated with the interview will be held in a password-protected file accessible only to myself and my supervisors. After a period of 5 years, in line with the rules of the university, it will be disposed by shredding and burning.
- If you agree to participate please sign the declaration attached to this statement (a separate sheet will be provided for signatures)

I can be contacted at: School of Built Environment and Development Studies, University of KwaZulu-Natal, Howard College Campus, Durban. Email: 214531904@stu.ukzn.ac.za

Cell: 076 3391026

My supervisor is Magdalena Cloete who is located at the School of Built Environment and Development Studies, Howard College Campus, Durban of the University of KwaZulu-Natal. Contact details: email cloete@ukzn.ac.za Phone number: 084 405 9602.

The Humanities and Social Sciences Research Ethics Committee contact details are as follows: Ms Phumelele Ximba, University of KwaZulu-Natal, Research Office, Email: ximbap@ukzn.ac.za, Phone number +27312603587.

Thank you for your contribution to this research.

DECLARATION

I.....
... (*full names of participant*) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire. I understand the intention of the research. I hereby agree to participate.

I consent / do not consent to have this interview recorded (if applicable)

SIGNATURE OF PARTICIPANT

DATE

.....
.....

APPENDIX D – GATE KEEPERS LETTER



104th
YEAR CELEBRATION

Date: 28th October 2022

To Whom It May Concern

This letter confirms that Mr Mbuso Mancotywa, a Masters student in the School of Built Environment and Development Studies at the University of Kwa-Zulu Natal, formally requested permission to interview a representative in our organisation and conduct a case study survey to which we have fully agreed. The data collected will be used in his Master's Research Project entitled: **EXPLORING VISUAL IMPAIRMENT THROUGH THE BUILT ENVIRONMENT; Towards A Multi-Sensory Skills Development Centre in Umbilo, Durban**

The study may be compiled in a few days, as it sets to include the following:

- Interviews will be conducted with members of staff to gain insight into understanding the relationship between visually impaired people and the built environment and the social issues that are associated with it.
- Distant observations will be done to understand how visually impaired people engage with the indoor and outdoor spaces.
- Architectural surveys of the buildings will include sketches and photographs to capture the architectural form and qualities of both internal and external spaces.

Thank you and Kind Regards.



Organization Representative Sign Above

Organization Name: KwaZulu Natal Society for the Blind

Mrs Magdalena Catharina Cloete

Supervisor.

SCHOOL OF BUILT ENVIRONMENT AND DEVELOPMENT STUDIES

Email: Cloete@ukzn.ac.za

Tel number: 031 260 1172

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