Transformation of Early Childhood Development and Responsive Learning Environments: A Collective Case Study in Outer-West eThekwini, KwaZulu-Natal, South Africa

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Transformation of Early Childhood Development and Responsive Learning Environments:
A Collective Case Study in Outer-West eThekwini, KZN, SA

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ABSTRACT

The purpose of this research was to explore the relationship between responsive learning environments and policy transformation in South Africa. The research problem considered how the relationship between quality childhood development and quality learning environments is not recognised in South African policies to support early childhood development. This oversight has led to the implementation and development of early childhood development (ECD) policies that disregard the potential for quality education that is generated through responsive learning environment designs. The theoretical lens employed for the study first included phenomenology, through the concepts of 'place', 'third space', and 'third teacher'. Secondly, it included reconceptualization of the ecological systems theory tied to pattern language, and thirdly, it included social and spatial justice. This approach was rooted in children's rights and the global sustainable development goals, considering the inequality of the ECD context in South Africa. The study followed a multimethodology that included phenomenology, architectural and environmental psychology, and participatory research within a collective case study situated on the outskirts of Durban (eThekwini), KwaZulu-Natal, South Africa. The research sites included two centres in a high socioeconomic area and six smaller centres in a low socioeconomic area, enabling comparison. The research design combined evaluative methods from architecture with the constructivist approaches of observations and interviews with participants, providing them with a voice within the interpretive/transformative paradigm. The research findings illustrated how the interrelated relationship between children and their environment forms the basis for quality ECD. Furthermore, the research indicated that the ECD sector in South Africa is under tremendous pressure in terms of the provision of centre-based care and learning, and there are a range of challenges hindering the progress towards transformation. These challenges stand in contrast to the transformation agenda of the National Development Plan and the Integrated Development Plan for ECD, which aim to provide equal access to quality ECD for all children. The research concluded that the transformation of early childhood development is related to the quality of the learning environments. The research identified the need for a review of the role of architecture, the potential of collaboration, and the policy framework as critical to addressing the inequality of learning environments in the country.

Keywords: Early Childhood Development, Responsive Learning Environment, Transformation, Policy, Inequality

isiZulu translation

UKUGUQULWA KOKUTHUTHUKISWA KWENGANE ESENCANE KANYE NEZINDAWO ZOKUFUNDA EZIPHENDULAYO: Ucwaningo Lwamacala Oluhlangene neNgaphandle eyeNtshonalanga, eThekwini, KwaZulu-Natal, eNingizimu Afrika

Lethulwe ngu: Magdalena Catharina Cloete

ISIZINDABA

Inhloso yalolu cwaningo kwakuwukuhlola ubudlelwano phakathi kwezindawo zokufunda eziphendulayo kanye nokuguqulwa kwenqubomgomo eNingizimu Afrika. Inkinga yocwaningo yayibheka ukuthi ubudlelwano phakathi kokuthuthukiswa kwezingane okusezingeni eliphezulu kanye nezindawo zokufunda ezisezingeni eliphezulu abuqashelwa kanjani ezinqubeni zaseNingizimu Afrika zokweseka ukuthuthukiswa kwezingane ezisencane. Lokhu kuqapha kuholele ekusetshenzisweni nasekuthuthukisweni kwezinqubomgomo zokuthuthukiswa kwezingane ezisencane (i-ECD) ezingayinaki inzuzo yemfundo esezingeni eliphezulu ekhiqizwa ngemiklamo yemvelo yokufunda ephendulayo. I-lens ye-theoretical esetshenziselwe lolu cwaningo yaqala yafaka izenzakalo, ngokusebenzisa imiqondo eyezokusebenzisa imiqondo “yendawo”, kanye ne”sikhala sesithathu” “nothisha wesithathu”. Okwesibili, yayihlanganisa ukucabanga kabusha ngemibono yezinhlelo zemvelo ezixhumene nolimi lwamaphethini, futhi okwesithathu, yayihlanganisa ubulungisa bezenhlalo nobesikhala. Le ndlela yayigxile emalungelweni ezingane nasezinhlosweni zomhlaba zokuthuthukiswa okusimeme, kucatshangelwa ukungalingani kwesimo se-ECD eNingizimu Afrika. Lolu cwaningo lwalusebenzisa izindlela eziningi ezazihlanganisa izenzakalo, izakhiwo nesayensi eyemvelo nengqondo, kanye nocwaningo oluhlanganyelayo ngaphakathi kocwaningo oluhlangene olusezindaweni ezingaphandle kweDurban (eThekwini), KwaZulu-Natal, eNingizimu Afrika. Izindawo zokucwaninga zazihlanganisa izikhungo ezimbili endaweni ephakeme yezenhlalo nezomnotho kanye nezikhungo ezincane eziyisithupha endaweni ephansi yezenhlalo nezomnotho, okuvumela ukuqhathanisa. Umklamo wocwaningo wahlanganisa izindlela

zokuhlola ezivela ekwakhiweni kwezakhiwo kanye nezindlela zokwakha zokuqashelwa kanye nezingxoxo nabahlanganyeli, ukubanikeza izwi ngaphakathi kwepharadigm yokuhumusha / yokuguqula. Imiphumela yocwaningo yabonisa indlela ubuhlobo obuhlobene phakathi kwezingane nendawo ezihlala kuyo obakha ngayo isisekelo se-ECD esezingeni eliphakeme. Ngaphezu kwalokho, ucwaningo lukhombisile ukuthi umkhakha we-ECD eNingizimu Afrika ungaphansi kwengcindezi enkulu maqondana nokunikezwa kokunakekelwa nokufunda okusekelwe esikhungweni, futhi kunezinselelo eziningi ezivimbela inqubekela phambili ekuguqukeni. Lezi zinselelo ziyaphikisana nohlelo lokushintsha lwe-National Development Plan kanye ne-Integrated Development Plan for ECD, okuhlose ukuhlinzeka ukufinyelela okulinganayo kwi-ECD esezingeni eliphezulu kubo bonke abantwana. Lolu cwaningo lwaphetha ngokuthi ukuguqulwa kokuthuthuka kwezingane ezisencane kuhlobene nekhwalithi yezindawo zokufunda. Ucwaningo lukhombe isidingo sokubuyekezwa kwendima yezakhiwo, amandla okusebenzisana, kanye nohlaka lwezinqubomgomo njengokubalulekile ekubhekaneni nokungalingani kwezindawo zokufunda ezweni.

AMAGAMA ANGUKHIYE: Ukuthuthukiswa Kwengane Esencane, Imvelo Yokufunda Ephendulayo, Ukuguqulwa, Inqubomgomo, Ukungalingani.

DECLARATIONS

I, Magdalena Catharina Cloete, declare that

(i) The research reported in this thesis, except where otherwise indicated, is my original work.

(ii) This thesis has not been submitted for any degree or examination at any other university.

(iii) This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.

(iv) This thesis does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:

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December 2024

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LIST OF ACRONYMS

CAPS – Curriculum and Assessment Policy Statement

CPERS – Children's Physical Environmental Rating Scale

ECD – Early Childhood Development

ECE – Early Childhood Education

ECEC – Early Childhood Education and Care

DBE – Department of Basic Education

DSD – Department of Social Development

EBD - Evidence-Based Design

HEAD project – Holistic Evidence and Design project

LE – Learning Environment

NELDS – National Early Learning Development Standards

NIDP – National Integrated Development Plan

RLE – Responsive Learning Environment

SA – South Africa

SDG – Sustainable Development Goal

SIN model – Stimulation, Individualisation and Naturalness model

UK – United Kingdom

US – United States

1. CHAPTER ONE – POSITIONING THE RESEARCH

Figure 1-1 Word Cloud of the Research Abstract

Source: Researcher (2024)

1.1 BACKGROUND AND OUTLINE OF THE RESEARCH

1.1.1 INTRODUCTION

More than a decade ago, I had the opportunity to visit a pre-school in rural KwaZulu-Natal, South Africa. The school had 70 children between 2 and 6 years old, and there were 2 teachers. The school was housed in a single space within a dilapidated structure with a leaking roof, crumbling mud walls, and an uneven floor. Inside, the light was dim, with only a few windows. The outside space was fenced with a gate, there were remnants of play equipment in the front, while around the back, there were ablution facilities that comprised two pit latrines housed in corrugated metal shelters. My tour guide on the day was a woman from the nearby town who was looking for ways to improve the school.

At that time, my children were still young and attended a privately owned pre-school in an urban area on the outskirts of Durban (eThekwini). The school was purpose-designed with large classes for each age group that opened to a large outdoor play area with a garden, trees, and well-designed play equipment. The class sizes were between 15 and 20 children, depending on the age group, and each class had a teacher and an assistant for the younger

children. The child-friendly classrooms, ablutions, multipurpose spaces, and outdoor play area were site-specific and met all the health and safety standard requirements.

The contrast sketched in these two brief descriptions provides a glimpse of the ECD status in South Africa. Between the above two extreme examples, I found a pre-school for a case study within a market in the city of Durban. The Qalakahle ECD Centre started its journey in one of the market stalls, and the baby area was limited to a double bed. The accommodation did not meet the Department of Health or the Department of Social Development's minimum requirements to register and receive funding for the children. However, the circumstances of this ECD centre changed completely through the intervention of a non-government organisation (NGO). The NGO worked with a local architect to design and build quality learning spaces appropriate for the children's needs. The architect and professional team donated their time and found further donors within the building industry to donate building materials (Cloete, 2016). Without the intervention of the ECD advocates, this pre-school could not provide quality care and education to the most vulnerable and disadvantaged communities. The changes in the learning environment enabled the transition from a place where children are kept while parents or carers are at work to a place that provides the potential for holistic ECD.

Figure 1-2 Qalakahle ECD Centre in its Original Learning Space

Source: Cloete (2016)

Figure 1-3 Qalakahle ECD Centre's new learning spaces

Source: Cloete (2016)

With global and local objectives to transform ECD, we cannot afford to rely on outreach from NGOs, faith-based organisations, or international aid organisations. The following research project intends to address the underlying issues that need to be facilitated from an architectural and policy perspective. Chapter One sets out the research background and context, frames the research problem and the aim, and phrases the research questions. The chapter concludes with an outline of each chapter of the report.

However, before embarking on the research journey, my position within the research needs to be considered. My interest in how architecture responds to childhood development stems from my journey to becoming and practicing as an architect. My interest in architecture as being purposeful and responsive first emerged in my Bachelor of Architecture dissertation, which explored how the design of a mental health facility could assist the healing process and attempt to destigmatise mental illness. My focus on the design of educational buildings originated during my time working in London, United Kingdom, for educational consultants specialising in educational buildings. While working for Effective Learning Environments (ELE), my role working within a multidisciplinary team included facilitating the design process between client, user, and architect (suggesting the notion of co-creation and co-design) to develop proposals for early education centres and the inclusion of physically disabled children

into a mainstream school and a special needs school. My work also included involvement in the development of new design guidelines for early childhood centres. Before returning to South Africa, I furthered my work in the field of education at Ellis Williams Architects, a design-orientated practice with an extensive school project portfolio. This role provided the opportunity to apply my knowledge of learning environments to the design of school buildings. Returning to South Africa with this experience, my perspective on the role of architecture shifted as I realised that the potential for societal change through responsive architectural design is yet to be explored in the context of the democratic SA.

My academic role for my masters degree by research therefore shifted to a focus on architecture and early childhood development, and I have since supervised several masters' projects with related topics. Furthermore, my work in curriculum development for post-graduate programmes and the architectural design and urbanism studio includes a strong focus on research-based design and participatory processes, instilling the notion of architecture as a mechanism for transformation in students. This approach includes understanding the rights-based perspective of design and embedding the Sustainable Development Goals within the curriculum.

From a personal perspective, my experiences raising four children involved negotiating learning and development settings to suit their individual needs. Each of my children presented with a non-typical dimension ranging from ADHD, dyslexia, combined ASD, and ADHD and dysgraphia, as well as all being highly intelligent, and this made me acutely aware of the role that the physical environment plays in responding to individual child development needs, confirming the notion of responsive architectural design.

I therefore entered this research, not as a novice young researcher but as an experienced professional and academic architect. I firmly believe in the value of architectural design and how it impacts society, and I am concerned that in the context of South Africa, the physical environment is mostly considered a low-level basic need that requires minimal functionality rather than as a potential for transformation.

Throughout the dissertation, my position is situated within the research rather than standing outside as an objective 'researcher'. Therefore, some of the writing includes first-person forms

such as I/my to accentuate my role in the exploration. This approach is particularly appropriate with the research paradigms of interpretivism and constructivism, which recognise the many world views and acknowledge the inherent subjectivity that forms part of the research experience.

1.1.2 BACKGROUND AND CONTEXT

The relationship between a person and the environment that they live in is a complex, interrelated system. Although the environment is primarily a combination of the physical and human environments, each of these environments consists of various aspects that influence our everyday experiences. Winston Churchill is one of several great thinkers who pointed out that we shape our environment, and then our environment shapes us. The architect and researcher Herman Hertzberger (2008) confirms this view by highlighting the importance of architecture and how every design decision impacts those who inhabit places daily.

The places where children are educated or cared for, specifically for the very young child, play a defining role in children's development (Dudek, 2005; Day and Midbjer, 2007; Hertzberger, 2008; Cleveland and Fisher, 2014; Barrett, Treves, Shmis, Ambasz and Ustinova, 2019). When we recognise that children spend considerable time in education and care environments, we must consider the nature of the physical settings and whether they provide dwelling places for children. In the first instance, places conducive to child development should be nurturing, safe, and explorative.

The term '**learning environment'** describes the spaces where formal education is provided (Lippman, 2010b; Kokko and Hirsto, 2021). In the case of early childhood development, this would include both the care and development of children. The term environment, in this instance, connects space as defined through built form and how this space is inhabited to create an atmosphere (Kokko and Hirsto, 2021). The design of a learning environment is developed by an architectural professional. However, the inhabitants further the design through furniture choice and layouts, colour choices, the display of learning materials, and more (Dudek, 2005; Sethusha, 2020). An essential component of the learning environment, specifically for younger children, is the outside areas, including hard and soft landscaping,

covered areas, enclosures, and connections to the surrounding contexts (Turner, 1999; Day, 2007).

Norberg-Schulz (1980; 1985) defined the concept of dwelling as a means to understand how our environmental experience creates meaning. Children naturally have heightened sensory perception; therefore, building their daily environmental experiences directly impacts their development. Day (2007); and Pinhao (2016) affirm the early childhood period as critical in developing an identity within a place. In parallel, Proshansky and Fabian (1987) define the development of place identity as the foundation for creating a healthy self-identity. Their argument is furthered by explaining how places' cognitive processing builds personality or character in a child. Our thought processes, memories, value systems, and beliefs are integrated into our physical environments. Internalising our perception and processing of place creates our place identity and influences our experiences and behaviours within specific environments. This integrated system of perception, cognition, and identity requires positive environmental experiences to achieve a positive outcome.

The developmental psychologist Bronfenbrenner (1979), who developed the Ecological Systems Theory, constructed a framework for understanding how the environmental influences on a young child's development include various contexts. The diagram (Fig. 1-3) is adapted from Bronfenbrenner's original representation of the four systems to highlight the relationship between architecture and childhood development in each context. The importance of learning environments is confirmed, noting that schools are placed in the various social contexts: the micro, meso, exo, and macro contexts. A more detailed discussion of the Ecological Systems Theory is covered in Chapter Three as part of the discussion of the theoretical and conceptual framework of the research.

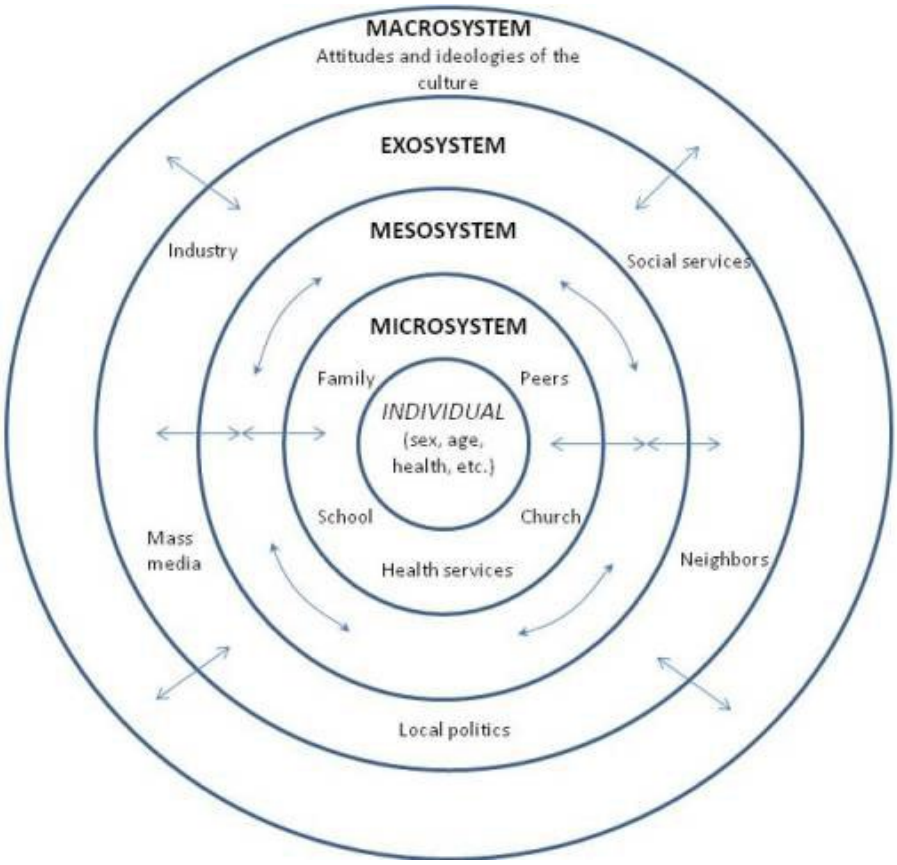

Figure 1-4 Ecological Systems Theory

Source: Bronfenbrenner (1979)

Recent studies in child and adolescent development continue to be explored through acknowledgement of the systems model (Damon and Lerner, 2008; Sims, 2015; Jamieson and Richter, 2017; Richter, Daelmans, Lombardi, Heymann, Boo, Behrman *et al*., 2017; Aldridge, Kilgo, Christensen, and Jepkemboi, 2018), particularly the way in which biology, psychology, culture, and history all represent interrelated influences that form part of the developmental system. Connection to systems thinking provides motivation for the role of ECD and the value of an integrated approach to early childhood development. Boyden, Dawes, Dornan and Tredoux (2019b) argue that influences exist at the macro and meso levels that impact negatively on children.

Considering these influences is important for the individual child and how they impact the developmental potential of the world. The child development advocate, the Bernard van Leer Foundation, recognises children as a collective future for society and emphasises the impact of what happens to children in their first days, months, and years of life. Their development is

directly related to the development of society and the development of our world (Bernard van Leer Foundation, 2015).

Early Childhood Development (ECD) is concerned with the holistic development of children from birth to eight years. The World Health Organisation considers this period a critical foundation for the rest of a child's life (WHO, 2007; Irwin, Siddiqi and Hertzman, 2007). Their argument states that many social ills, such as mental health issues, stunting/obesity, heart disease, criminality, numeracy abilities, and literacy abilities, are rooted in early childhood. Based on research evidence, they argue that "investment in early childhood is the most powerful investment a country can make, with a return over the life course many times the amount of the original investment" (Irwin *et al.*, 2007, p. 5).

According to the Center on the Developing Child at Harvard University, the way we care for children determines the future of society. They advocate that child development establishes the substructure on which communities and the economy can be built. Based on scientific research in the fields of neurobiology, developmental psychology, and the economics of human capital foundation, the centre proposed five core developmental concepts with implications for policy and practice (Center on the Developing Child, 2007):

- The development of our brains occurs over several years, starting at inception and only reaching maturity years later in adolescence. However, the first year is critical in creating the core, and some development is completed by the age of five (as seen in Fig. 1-5).
- Development is orchestrated within a connected system of nature (genes) and nurture (experience), where active engagement between the child and their surrounding environments is critical. Here, the term 'environment' includes social and physical aspects that play an essential role.
- The process of development and the formation of brain architecture are scaffolded over time, where simple skills and circuits provide the bases for the more complex to follow. Over time, the capacity for change becomes more difficult as the brain starts to mature.

- Development is an interconnected process that combines cognitive, emotional, and social capacities. If one of these capabilities falls behind, it directly impacts the development of the other two.
- Early childhood is particularly sensitive to toxic stress. The continuous impact on stress hormones and the nervous system can negatively impact a child's physical and mental health, which causes learning and behaviour problems well into adulthood.

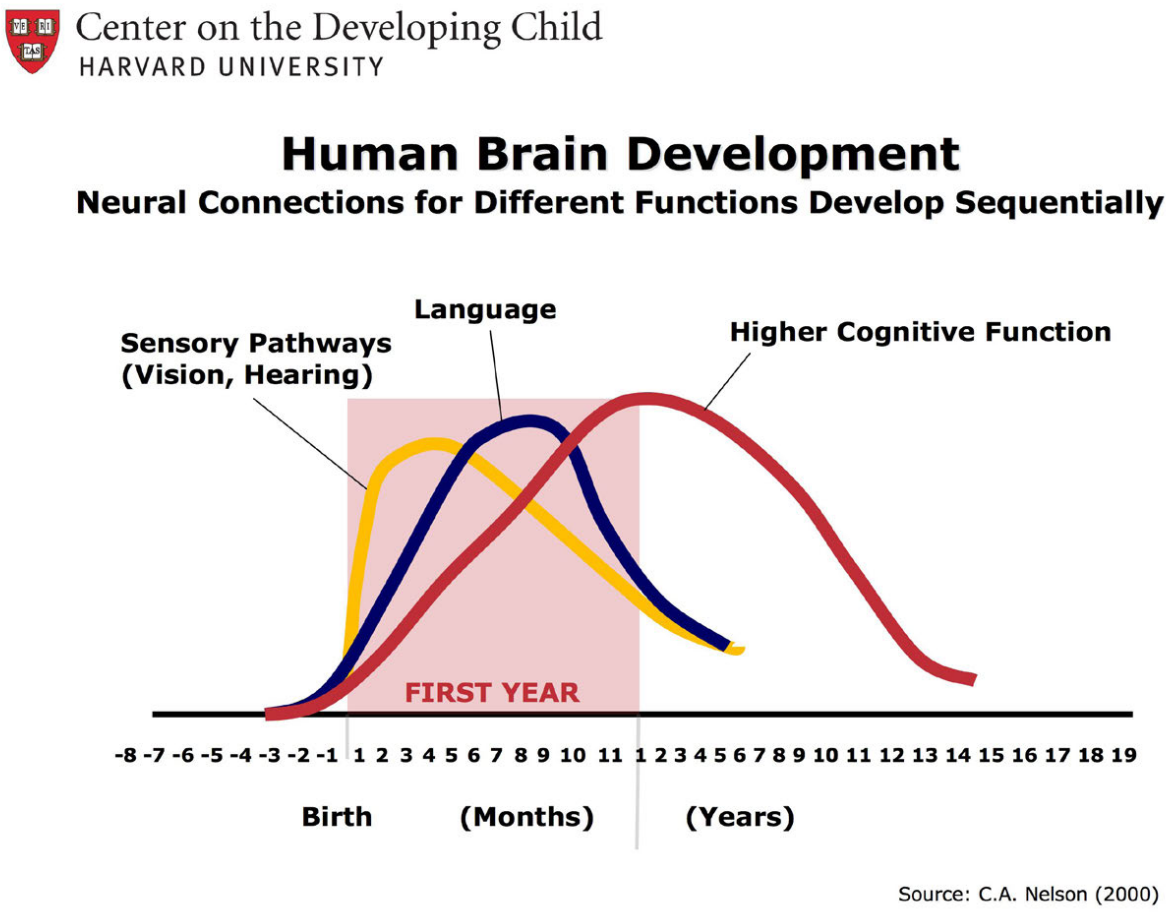

Figure 1-5 Brain Development

Source: (Nelson, 2000)

Each of these core concepts is unpacked in terms of its implications for how the policies relating to the ECD of a country are framed and their implementation in practice. The repeating themes within the implications include: the importance of early intervention; the need for interventions in the homes and community, with the establishment of community-based holistic or comprehensive early childhood development and monitoring; the

importance of acknowledging the voices of children as they relate to their own lives; quality early childhood care and education are required; saving on expenses leads to poor quality of services that do more harm than good, and it is a waste of resources. The report concludes that the focus on intervention in the most disadvantaged communities with holistic ECD will reap the highest benefits in the long term (Irwin *et al.,* 2007).

"The Convention [on the Rights of the Child] changed the way children are viewed and treated —i.e., as human beings with a distinct set of rights instead of as passive objects of care and charity" (www.un.org). The following articles of the Convention are particularly relevant to this research project:

- Article 28 stipulates the right to education (confirming the need for preschooling).
- Article 12 stipulates the ability of children to form and express their views in matters that impact their lives (confirming an approach to fieldwork that enables their participation and voice).
- Article 24 provides the right to health (demonstrating the need for physical environments that facilitate healthy development).
- Article 31 includes the right to play and cultural expression (confirming the need for learning environments that enable play and culturally sensitive responses).

The Global Report on Equity and Early Childhood (The Consultative Group on Early Childhood Care and Development, 2016) advocates the need to expand and improve our youngest children's development and care, specifically for disadvantaged and vulnerable populations. Early childhood development is defined to include all children from birth to six years, usually the period before primary education. UNICEF confirms the same views on the importance of early childhood development while focusing on the potential to eradicate poverty. By implementing quality, comprehensive ECD for children from disadvantaged and vulnerable communities, children's future potential is transformed (UNICEF, 2006).

In South Africa, the term ‘ECD’ as contained in legislative documents tends to focus on the zero to four years. ECD thus excludes the formal primary education of Grade R (reception), the school year before primary school that children attend when turning six years old, and the foundation phase, the first three years of primary school, starting at grade one for children turning seven until grade three. The focus of this study is to include children from birth to six years of age in terms of their comprehensive development, where physical, cognitive, sensory,

emotional, linguistic, and social aspects are all included. An integrated approach to child development has all the elements listed above.

The integrated child development approach is an internationally recognised policy system that was developed in the 1970's to achieve comprehensive early childhood development, specifically to impact societies in the Global South. The approach is rooted in the holistic understanding of child development that developed during the early 1900s from the theoretical approaches of Bronfenbrenner, Freud, Erickson, Piaget, and Vygotsky (Oates, Grayson and Wood, 2005; McCartney and Phillips, 2008; Rigolon and Alloway, 2011; Louw and Louw, 2014). The integrated child development approach is a policy mechanism to establish a cross-sectional system to coordinate all children's holistic development. The first implementation of this approach was established in 1972 in disadvantaged areas of Columbia. The fundamental principle of the system is to provide ECD in all areas that impact child development within a community framework (Vargas-Barón, 2005). The integrated approach in Cuba has been reported as successful in transforming children's development (Laire, 2016). In South Africa, government policies have been developed with the necessary directive to transform early child development through an integrated approach (Jamieson, L., Berry, L. and Lake, L., 2017). The fundamental principle of the system is to provide ECD in all areas that impact child development within a community framework.

South Africa initiated the transformation of ECD in 1996, post-Apartheid, with the development and implementation of a compulsory pre-school year, with suggestions of extending to a mandatory second year, Gr R and Gr RR for children turning five (South African Government News Agency, 2020). In 2005, the National Integrated Development Plan for ECD was launched, bringing together ECD's health, education, and social aspects. The primary aim of the integrated plan is to transform ECD throughout the urban and rural areas of South Africa. The policy is underlined by global research that proves how early investment in children leads to the transformation of society (Irwin, L., Siddiqi, A. and Hertzman, C., 2007; Sayre, R. K., Devercelli, A.E., Neuman, M. J., Wodon, W., 2008; Huebner, Boothby, Aber, Darmstadt, Diaz, Masten *et al.*, 2016; Richter, L. M. Daelmans, B., Lombardi, J., Heymann, J., Boo, F. L., Behrman, J. R., *et al.*, 2017). The primary aim of the National Integrated Development (NID) plan for ECD is to enable the **transformation of ECD**.

The development of children consists of a range of aspects that all need to work together. In South Africa, five domains have been identified as 'the essential package' as shown in Fig. 1-6 (Hall, , K. , Sambu, W., Berry L., Giese, S., Almeleh, C. and Rosa, S., *et al.*, 2019).

Figure 1-6 Essential Facets of ECD

Source: Hall *et al.* (2019, p.06)

In South Africa, the pivotal role of early childhood development (ECD) in reducing poverty and socio-economic inequality is broadly accepted and supported. The Integrated Development Plan is acknowledged by child development experts as representing best practice as a policy. However, the disparity is continuous, with most children starting school at a lower developmental level. Fig. 1-7 illustrates the status report across these five domains for 2019, indicating poor progress across three of the domains, including stimulation for early learning.

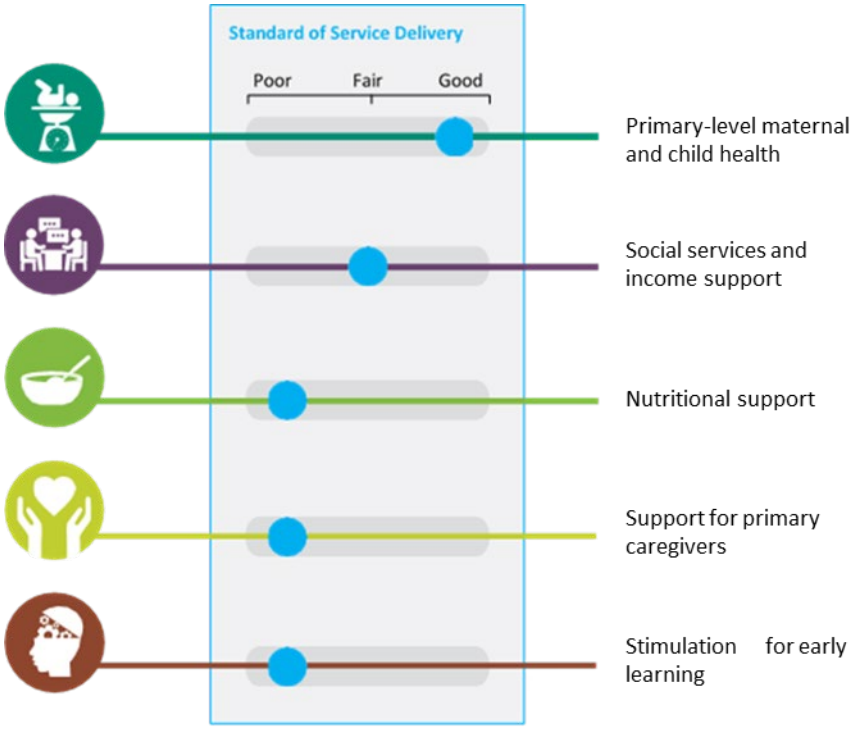

Figure 1-7 Status of ECD delivery in SA

Source: Hall *et al.* (2019, p.04)

These poor standards of ECD delivery impact directly on children's progress at the primary school level, which later contributes to the high dropout rates during secondary schooling. The poverty cycle is thus continued through to another generation of marginalised adults who lack the education and social-economic foundation to participate and contribute to empowering society. Therefore, "despite the many successes and achievements of the post-Apartheid period, ECD as a sector lags behind" (Hall *et al.*, 2019, p. 6). The most recent Thrive by Five Index indicated that more than half of the children under the age of five in South Africa are below their developmental potential (Thrive By Five, 2022). Although the latest index outcomes could also indicate some impact of the COVID-19 pandemic, the findings provide confirmation of earlier studies (Thrive By Five, 2022).

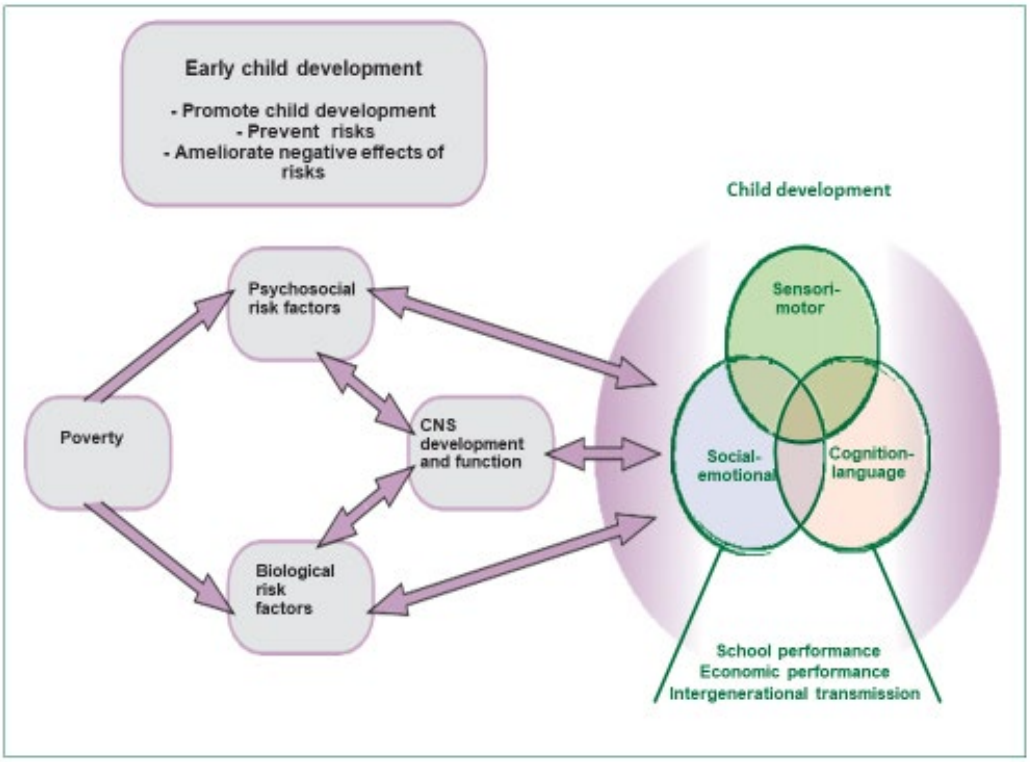

Figure 1-8 Conceptual Model of how Intervention Impacts on ECD

Source: Engle, Black, Behrman, Cabral de Mello, Gertler, Kapiriri *et al.* (2007)

The lack of children who 'thrive by five' years of age aligns with the statistics relating to cognitive tests, which shows the devasting impact of poverty on children. The South African Early Childhood Review 2019 indicates that the throughput rate for the foundation phase is 84 per cent (Hall *et al.*, 2019). The National Mathematics Assessment further reports that in grade 5 (10 to 11 years old), only 39 per cent of South African children achieve the required competency. A similar assessment for reading comprehension in grade 4 (9 to 10 years old) indicates that only 22 per cent of the children read at the appropriate level. The poor scholastic performance could be ascribed to high levels of poverty, the low education levels of mothers, the lack of either mothers or fathers as the primary caregivers, and poor ECD attendance rates (Venter, 2022). The 2019 SAEC Review indicates that 70 per cent of 0–2-year-olds and 39 per cent of 3-5-year-olds are cared for at home. Although interventions to enable early stimulation in these home environments exist, there are no reliable statistics to know their effect (Hall *et al.*, 2019). As illustrated in the conceptual model (Fig. 1-8), the role of ECD intervention is to change this trajectory. With the devastating statistics from South Africa as a background and

considering the research by Engle *et al.* (2007); and Rao, Sun, Wong, Weekes, Ip, Shaeffer *et al.* (2014) that examined the impact of adverse childhood experiences on adult outcomes, we must concur with Heckman (2012) that early investment must be a top priority for developed countries, but more specifically for the developing world.

Heckman (2012) presents the argument for early intervention through research based on two United States longitudinal studies that aimed to trace early childhood development interventions' impact on disadvantaged children. The projects both included early learning/stimulation and building a relationship with the parents, with a focus on holistic development, which included cognitive and non-cognitive development, nutrition, and the health of the children. The parents also assisted with employment and social services-related issues. The overall outcome of these programmes shows the success of an early intervention. The comparison of this kind of intervention with those that are targeted at later stages of life confirms the higher success of early intervention. The value of interventions at any stage of life is repeatedly confirmed by research (Crosnoe, Wirth, Pianta, Leventhal, Pierce and NICHD Early Child Care, 2010; Magnuson and Duncan, 2016; Boyden *et al.*, 2019b). However, as Heckman states, the chances of success are much higher if the interventions occur during early development: “Early mastery of a range of cognitive, social, and emotional competencies makes learning at later ages more efficient and therefore easier and more likely to continue” (Heckman, 2012). The Heckman equation includes three components: investment, development, and sustaining quality education towards gaining individuals in society who will contribute to further growth. In the developing world, this equates to breaking the poverty cycle (Heckman, 2012; 2016).

Furthermore, UNESCO and governments globally have included approaches to implement the notion of early intervention through early childhood development and education policies. However, when developing policies to support ECD, some questions arise regarding the practicality of its implementation. These are about what type of programme is needed, who needs to be targeted, the funders, and who will do the implementation. Following the developmental systems approach, a further key question would be how child development fits into other systems. The integrated approach to ECD develops ways in which holistic child development can be achieved. According to Vargas-Barón (2005, p7), the integration aims

include ensuring that "each child will be healthy, well-nourished, and live in a clean and safe environment". The approach further aims to integrate the various systems or sectors that support child development. A more comprehensive service can be achieved through this overlap of strategies concerned with social well-being, health, and education, and the strategies should also be cost-effective and have a broad impact.

The focus of this research is primarily on the domain of 'stimulation for early learning' which is identified in the SA ECD report as "the development of perceptual, motor, cognitive, language, socio-emotional, and self-regulation skills in the home through responsive caregiving". This domain is a "critical component of ECD" (Hall *et al.*, 2019, p. 6). Stimulation of early learning is a critical component towards positive outcomes at school and becoming a productive member of society. It is, however, crucial that the domain form part of a holistic view where all five domains are successfully addressed. Without nutrition and a supportive family environment, the impact of early learning cannot reach its full potential. Fig. 1-9 illustrates the interrelated systems that enable quality early childhood development.

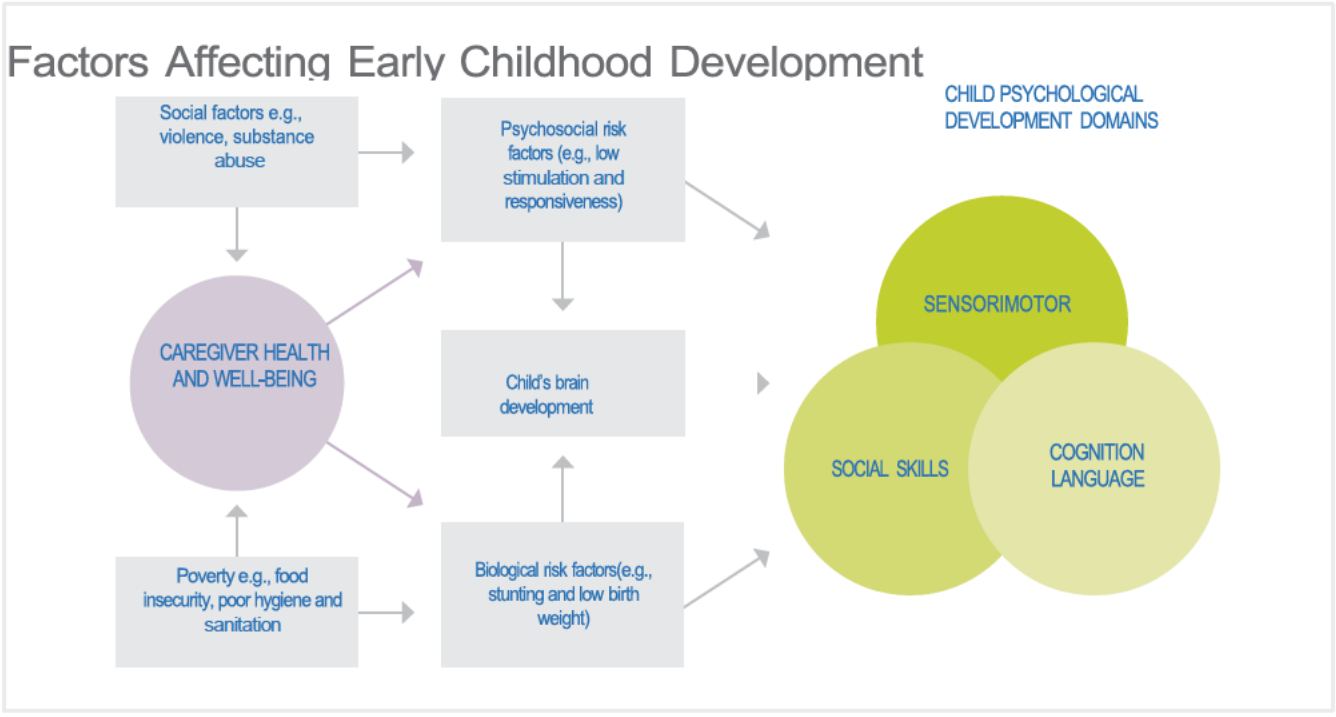

Figure 1-9 Factors Impacting on ECD

Source: Hall *et al.* (2019, p. 7)

In South Africa, the recent move of the ECD sector from the Department of Social Development (DSD) to the Department of Basic Education (DBE) and the proposed new compulsory year of schooling (grade R) indicate positive steps that should speed up the transformation of ECD (Atmore, 2023). Research indicates that, from a policy perspective, South Africa has progressed well. However, implementation through services is lagging, particularly in the nutrition, early learning, and caregiver-support areas (Hall *et al.*, 2019; Rudolph, Millei and Alasuutari, 2019; Wills, Kotzé and Kika-Mistry, 2021). The lack of adequate funding for the ECD sector seems to be a significant stumbling block that is impacting negatively at various levels, from coordination and management of the rather complex integrated system to, more critically, the day-to-day operations of ECD centres in South Africa. The following aspects are particularly concerning:

- There is still a need for an effective central mechanism to mobilise and coordinate a national programme for young children.
- The ability and capacity to deliver quality services at scale are still lacking, particularly in terms of implementing strategies for nutritional support, **early learning**, caregiver support, child protection for all children who need it, and enhanced support for children with disabilities.
- There is still a need for systems to monitor services and measure progress routinely for most child outcomes.
- There is a recurring lack of roll out of **infrastructure** to support early learning and its related services.

The ECD census (Department of Basic Education, 2022b) and the Thrive By Five (2022a) initiative indicate that the involvement of the DBE has placed renewed focus on early intervention. The importance of providing infrastructure—in other words, learning environments that respond specifically to children's needs—is advocated through UNICEF's work, which aligns with the *Convention on the Rights of the Child* (1989). In parallel, the United Nations (UN) *2030 Agenda for Sustainable Development* includes a commitment towards access to quality early childhood development, care, and pre-primary education, as stated in Sustainable Development Goal number 4 (SDG 4). This focus on providing quality care is primarily targeted towards the developing world, where most disadvantaged and vulnerable children live (Bernard, 2012; The Consultative Group on Early Childhood Care and

Development, 2016). However, in South Africa, the statistics in the *South African Early Childhood Review* indicate deficient levels of ECD attendance (Hall *et al.*, 2019):

- Only 21 per cent of children aged 0-2 attend an early learning group programme.
- Only 69 per cent of children aged 3-5 attend an early learning group programme.

Providing development, care, and education opportunities starts with providing a building, a play area, or a place for children. In most traditional African cultures, young children are cared for within their immediate family and village community (Pence, Evans and Garcia, 2008). Therefore, the notion of a place designed specifically to provide for nurturing and stimulating children's development is somewhat foreign. The conditions of the learning environments in South Africa vary broadly, from marginally adequate classrooms with minimal requirements for health and safety to purposely designed, well-equipped learning environments (Thrive By Five, 2022). The majority of places for children are accommodated in adapted buildings originally built for other adult purposes. The development of pre-schools often includes a haphazard assembly of rooms built at various stages as the need arises. The involvement of architectural design as part of the development is often limited, specifically in marginalised communities (Thrive By Five, 2022).

The relationship between quality early childhood development (ECD) and learning environments (LE) is included in the policies to support ECD in many developing countries, including South Africa. However, in South Africa, the inclusion of quality learning environments is severely limited by the implementation of the policy across government departments at provincial and municipal levels. The spatial requirements from the DBE, DSD, and Department of Health provide only the minimum standards and a standard formula for implementing childcare and school infrastructure. Similarly, local authorities also stipulate only basic requirements (Cloete, 2016; Department of Basic Education, 2022b).

The policy framework and fiscal conditions of the ECD sector in South Africa do not support the **transformation of ECD learning environments** (Atmore, 2023). The general focus of guidelines is on functionality and minimum standards, leading to the implementation of a replicable formula. While the National Integrated Plan for ECD (Department of Social Development, 2015) requires an ECD provider to meet these requirements before registration, limited funding has been made available to develop the infrastructure required (Madyibi and

Bayat, 2021; Department of Basic Education, 2022b). The implementation of the plan also often disregards the potential of a responsive approach to educational architecture, where the architectural design specifically considers both its context and the future inhabitants (Cloete, 2016; Coetzee, du Toit, Crouse and Roos, 2022).

Globally, the emerging field of learning environment research (LER) and increased use of evidence-based designs (EBD) and post-occupation evaluations are improving quality and responsiveness (Lippman, 2010b; Berris and Miller, 2011; Bernard, 2012; Močinić and Feresin, 2017). Learning environments designed to foster quality learning and respond specifically to the inhabitants can enhance the overall well-being of learners and teachers and improve learners' educational outcomes (Dierkx, 2002; Dierkx, 2003; Clark, 2010a; Bernard, 2012; Cleveland, 2015; Rutherford, 2015). Most research in this field is from a global perspective, as LER has not yet become established in Africa and South Africa. Wood (2020) furthers the debate on this field with an argument for school buildings to be established according to an ‘as-built’ policy, where the relationship between architecture and education is unravelled as a multi-layered system of policy, design, and lived experiences within learning environments.

The research presented in this study's context is selected to present two diverse settings for children as tangible examples of the extreme differences found throughout the metropolitan areas of South Africa. The selected area of the Durban Metropolitan Area in KwaZulu-Natal Province is a clear illustration of the diversity of contexts found throughout South Africa. The research focuses on early childhood development centres, also called pre-schools or edu-care centres, which provide care and development for children between the ages of 0 and 6 years. The case study includes two diverse socio-economic scenarios to provide data representing the range of facilities found in South African metropolitan areas. The selected context is in the peri-urban setting of the outer-west municipal zone of Durban (eThekwini) and includes the affluent area of Hillcrest/Waterfall and the disadvantaged areas of the Valley of a Thousand Hills, which consist of the townships of Embo and Inanda. The case study sites are presented in detail in Chapter Five.

1.1.3 MOTIVATION FOR THE RESEARCH

This research aims to investigate the relationship between ECD learning environments and ECD transformation in South Africa. The study follows a range of architectural research methods, combining approaches from phenomenology, architectural building evaluations, and environmental psychology with participatory research within this multiple-case study situated on the outskirts of Durban (eThekwini), KwaZulu-Natal, South Africa.

Combining these approaches to architectural research is necessary to investigate what responsive learning environments encompass. My masters research project (Cloete, 2016) defined the three critical strategies for improving early childhood development learning spaces. Namely responsiveness, third teacher, and community:

a.) Responsiveness describes how the environment should respond to both context (physical, cultural, social) and people, the very inhabitants of the spaces (Lippman, 2010b).

b.) The third teacher defines the environment as providing silent lessons related to the curriculum by being child-centred, innovative, and allowing for exploration (Nicholson, 2005).

c.) Community concludes the design of a child-centred environment as part of an ecosystem for childhood development based on the principles of an integrated approach. This approach aims to achieve ownership and identity within the community (Nair and Fielding, 2005; Lippman, 2010b).

The concepts of ‘responsiveness’, ‘third teacher’, and ‘community’ capture the vital aspects of the quality of learning environments. Responsive architectural design results from a contextual understanding of the design problem, allowing for sustainable development that considers all socio-cultural, pedagogic, economic, and environmental factors.

I am exploring the above strategies through multiple research approaches to develop principles for a policy framework to support responsive ECD learning environments. Although this research project is rooted in these concepts, the process of engagement with the women

heading the various ECD sites and the impact of inequality steered me towards considering the role of the lack of responsive ECD learning environments in the transformation of ECD.

The research problem considers that the relationship between quality childhood development and the learning environment is not recognised in South African policies to support ECD, and recognition of this relationship would enable the design and building of places that support quality early childhood development. This oversight has led to the implementation and development of ECD policies that disregard the potential quality outcomes of these spaces that could be generated through responsive approaches to learning environment design. The context and inhabitants of a place determine its responsive architectural design, and such learning environments can become a third teacher that provides silent lessons as part of an active learning pedagogy. Responsive ECD learning environments are child-centred and form part of the broader ecosystem of the community as a learning environment (Nair and Fielding, 2005; Lippman, 2010b).

The research questions what is the relationship between responsive learning environments and early childhood development policy transformation in South Africa? The research contribution addresses the gap in learning environment research in developing countries, specifically South Africa. Secondly, the study will impact the application of a range of research approaches, including participatory methods that could lead to the responsive architectural design of learning environments to inform the ECD policies of South Africa.

The overarching topic is concerned with learning environments for children between the ages of 0 and 6 in the developing world. The research is rooted in social and spatial justice and situated within a phenomenological approach, spatial experience, the field of environmental psychology, and the emerging approaches to participatory research (Lucas, 2016).

1.2 THE RESEARCH PROBLEM, AIM, AND OBJECTIVES:

The research problem of this study is defined by three concepts, namely: learning environment, early childhood development, and transformation. The following section will discuss the research problem through these three conceptual lenses.

Learning Environments:

The conditions of the learning environments in South Africa fall within a broad range, from barely providing the minimal requirements of health and safety to marginally adequate classrooms and purposely designed, well equipped learning environments at the other end of the spectrum. The ECD policy in South Africa only provides the minimum requirements to meet health and safety standards. To exacerbate this issue, government funding for the ECD sector does not include developing new infrastructure (Madyibi and Bayat, 2021).

The relationship between quality early childhood development (ECD) and learning environments (LE) is not recognised in the policies that support ECD in South Africa, perpetuating the cycle of inequality. This implementation and development of ECD policies that include limited focus on the potential of a responsive approach to LE, where the LE specifically considers its context and the inhabitants, is inhibiting the transformation of ECD in South Africa.

Early Childhood Development:

The relationship between childhood development and the built environment is seldom considered in the design, construction, and occupation of learning environments for early childhood development in South Africa (The DG Murray Trust, 2011; Atmore, Van Niekerk and Ashley-Cooper, 2012a; Hall *et al.*, 2019; Department of Basic Education, 2022b). However, the experiences of the children and adults who spend their days in these learning environments are directly impacted by their quality. New approaches within environment-behaviour research include both children's and adults' participation in understanding the users' perceptions and improving the quality of the environments (Lippman, 2010b; Barrett, Zhang, Davies and Barrett, 2015; Matthews and Lippman, 2016; Botsoglou, Beazidou, Kougioumtzidou and Vlachou, 2019). Allison Clark (2010b) developed the mosaic approach and first used it in England to improve outdoor play areas within the ECD context. Her research approach has subsequently been borrowed and adapted in various forms in other disciplines and contexts, but the application of these new approaches to learning environment research within the context of Africa is limited.

This research, therefore, explores the built form and immediate context of eight ECD centres in combination with the experiences of their inhabitants within a defined context in South

Africa. The case study approach enables an understanding of the quality of the learning environments from an architectural perspective, as well as through the voices of the users. The current framework of policies governing the ECD sector in South Africa mentions quality without providing mechanisms to ensure that learning environments become tools towards the transformation of young children (Thrive By Five, 2022). This exploration using environmental quality analysis and the voices of women who work in these environments daily will provide the insight to initiate change towards improving the quality of ECD learning environments. (Thrive By Five, 2022).

Transformation:

The concept of transformation considers how unequal socio-economic conditions, unequal development, slow progress, and minimal development can be changed. Early childhood development has the potential to change society. Researchers globally recognise the importance of early intervention in children's overall well-being and development, as it impacts their personality and social behaviour (Engle *et al.*, 2007; Pence *et al.*, 2008; Heckman, 2016). The 2015 World Bank Early Childhood Development Investment report provides a strong argument about the value of an early intervention, stating that it provides the best returns. Their evidence considers that 40 per cent of the world's population of children below five live in poverty and show developmental delays due to malnutrition or stunting (Grantham-McGregor, Cheung, Cueto, Glewwe, Richter, Strupp *et al.*, 2007). The long-term impact of children growing up in poverty leads to low academic outcomes and poor cognitive abilities. The Child Development Series provided by The Lancet in 2007 (Engle *et al.*, 2007) focused on the loss of developmental potential of more than 200 million children in the developing world, and it defined ECD as the ordered emergence of interdependent skills of sensorimotor, cognitive-language, and social-emotional functioning.

The integrated approach to ECD was developed with the aim of comprehensive ECD, specifically within the challenging situations in the Global South, but it is as appropriate for targeting the development of children within any nation. The first implementation of this approach was established as early as 1972 in disadvantaged areas of Columbia (Vargas-Barón, 2005). The fundamental principle of the system is to provide ECD in all areas that impact child development within a community framework (Bernard van Leer Foundation, 2011). The South

African government's policies provide the curriculum, improve teaching capacity, and encourage parents to enrol their children in childcare facilities (DoE, 2001). One of the primary instruments in the scaling up of ECD in South Africa is the National Integrated Development Plan for Early Childhood Development (2015), which aims "at transforming early childhood development service delivery in South Africa, in particular, to address critical gaps and to ensure the provision of a comprehensive, universally available and equitable early childhood development services" (Department of Social Development, 2015, Excutive summary, p8). The provision of quality places for care and education for children between the ages of 0 and 7 is emphasised as a critical component of the overall plan towards eradicating poverty.

However, the concept of early investment and the policies that are designed to initiate holistic ECD are dependent on financial resources. One of the issues around funding is the notion of pre-distribution or redistribution, as Heckman (2012) describes it. Although the ratios between the advantaged and the disadvantaged in the US do not compare well with those in many developing countries or South Africa, the notion of pre-distribution is the only path that could lead to the eradication of the poverty cycle. However, Heckman (2012) states in closing that "giving money to poor families does not, by itself, promote social mobility across generations"(n.p.).

Engle *et al.* (2007) provide the following reasons why the government should invest in ECD:

- It is the most cost-effective period in the child's life to invest in.
- Events in the early years of a child's life influence the child's productivity and learningability throughout the life course, and are effective strategies for reducing poverty among disadvantaged populations.
- Programmes increase the efficiency and effectiveness of school expenditures by reducing drop-out and repetition.
- Increased schooling for girls has a long-term effect on their children's survival, growthand development.
- Interventions are more sustainable because parents and families carry these changesover to subsequent children.
- There is a strong evidence base on effective interventions for early child development.
- The Convention on the Rights of the Child ensures every child the right to development as well as survival, and requires governments to support families in childrearing.

The argument (Engle *et al.*, 2007) further establishes the need to integrate ECD programmes into other systems, in line with the integrated development approach described above. It is

reassuring that the approach taken by the South African government follows research and recommendations at a global level. However, several concerns have been raised about the implementation and effectiveness of the policy, especially as related to the provision of quality learning environments (Madyibi and Bayat, 2021; Atmore, 2023).

My research follows these concerns about the implementation and how several factors negate the effectiveness of the policy. A significant problem is the lack of government funding to establish ECD centres, train ECD staff, and monitor the distribution of government grants to the centres. A further critical concern is the diversity and general lack of quality in learning environments. My project includes a collective case study of two ECDs in a high socio-economic community and six smaller ECD centres in a disadvantaged community. My research focuses on understanding people's experiences on the ground and the women who built up each centre, the teachers, and, through observation, the children. These are the people directly impacted by the implementation of the policies. Although the study is small compared to numbers in South Africa, it provides a deeper understanding and supplements the recent ECD census and Thrive by Five data (Department of Basic Education, 2022a; 2022b; Thrive By Five, 2022).

The overall aim of the South African National Integrated Development Plan for Early Childhood Development (Department of Social Development, 2015) is to enable the transformation of society through early investment. However, the crucial requirement of quality learning environments has been neglected as a critical strategy to transform early childhood development.

1.2.2 AIMS

To explore the relationship between responsive learning environments and early childhood development policy transformation in South Africa.

1.2.3 OBJECTIVES

The objectives of this study are:

1. To determine the relationship between early childhood development transformation and early childhood development learning environments.
2. To explore the relationship between the quality of early childhood development and the quality of early childhood development learning environments.
3. To review the status of early childhood development transformation in post-Apartheid South Africa in the context of local and global development goals.
4. To assess and analyse the quality of the early childhood development learning environments of a selection of early childhood development centres in two diverse socio-economic contexts in eThekwini, KZN, South Africa.
5. To understand early childhood development learning environments from the lived experiences of the adult and child occupants.
6. To review how the South African policy framework on early childhood development impacts the quality of the early childhood development learning environments in the country.

1.2.4 RESEARCH QUESTIONS

The aim of the research is considered through an overarching question that maps the exploration:

> What is the relationship between responsive learning environments and early childhood development policy transformation in South Africa?

The secondary questions are each designed to provide a mechanism for the research to achieve each of the objectives. Table 4-1 Research Design Matrix on p. 161 provides details of how each objective and question is integrated into the study:

1. What is the relationship between ECD transformation and the ECD learning environments?
2. What is the relationship between the quality of the ECD and the quality of the ECD learning environments?
3. What is the status of ECD transformation in post-Apartheid South Africa in the context of local and global sustainable development goals?

4. What are the ranges and qualities of the ECD learning environments in a selection of ECD centres in two diverse socio-economic communities in eThekwini, KZN, South Africa?
5. How do the selected ECD centres' occupants (children and adults) experience their learning environments?
6. How does the South African policy framework impact the quality of ECD learning environments?

1.3. SCOPE OF THE STUDY

The ontological position of the research can be described as interactive, meaning that it will combine both views of reality where it is conceived objectively (quantitative) and subjectively (qualitative) (Creswell and Creswell, 2018; Salama, 2019). As a researcher entering the field of ECD and its learning environments, it is not possible to simply observe this reality without becoming part of it (Gallacher and Gallagher, 2008). However, aspects of the reality will be based on tangible measurements, which can be observed independently of perceptions (Lucas, 2016). The epistemological position on the production of knowledge or collection of the majority of the primary data is that the knowledge will be co-constructed. This is where the researcher becomes a participant, and the participant can also become a researcher (Sutton, 2007; Creswell and Creswell, 2018).

The tangible research components need to be approached from a positivist/scientific perspective, as environmental parameters such as the size of spaces, the building materials, and light, sound, temperature, and humidity are measured to gain exact readings (Korpela, 2002; Cleveland and Fisher, 2014). The measurements are not based on human interpretation or how the research perceives these qualities; they are scientific facts. On the other hand, the researcher conducting the measurement will, at the same time, experience these environmental parameters and observe how the occupants of the given environment experience the qualities through their behaviour or perceptions.

Therefore, the research approach brings together different world views or ontological and epistemological paths to research. A mixed-methods approach fits within the discipline of

architecture, which is often found between science and the humanities (Creswell and Creswell, 2018). However, the study leans strongly towards a qualitative approach, as discussed in detail in Chapter Four.

The contributions to new knowledge are multiple: Firstly, the research contribution addresses the gap in learning environment research in developing countries, and specifically in South Africa. Secondly, the research contribution includes the application of a holistic environmental quality evaluation method in ECD in South Africa. The scale of the case study is limited in scope, providing only a small sample of the range and qualities of the ECD learning environments in South Africa. The study indicates that this methodology can be successfully applied in South Africa, where ECD learning environments form a range of typologies. Thirdly, the study presents the lived experiences of women from the ECD sector in eThekwini, contributing towards a better understanding of how the ECD policies impact their efforts towards quality ECD. Fourthly, the theoretical and conceptual framework provides a transformative approach to understanding ECD learning environments. Together, these enable the development of principles to frame a policy for responsive ECD learning environments towards the transformation of ECD in South Africa. This research approach could lead to the inclusion of responsive approaches to LE as part of the ECD policies of South Africa and could potentially find relevance in developing countries.

1.3.1 DELIMITATIONS OF THE RESEARCH PROBLEM

The research is situated within the discipline of architecture. There is a crossing of disciplinary boundaries as appropriate to the topic dealing with learning environments (education), early childhood development (developmental psychology), and policy (governance). However, the scope of these disciplines will be limited to what is appropriate to support the primary research aims and objectives, and includes the following: A literature review provides the background, context, and state of the learning environments, with a focus on those that support early childhood development in South Africa and other developing countries. The scope of the primary data collection includes the investigation of a multiple-case study of eight ECD centres in a specific geographical area. Data is gathered through holistic environmental quality evaluations to establish the range and quality of the existing learning environments. A participatory approach is applied to understand the experiences of the occupants of the ECD

centres. The primary data analysis provides insight on how the existing ECD policy framework is impacting the quality of learning environments.

1.3.2 STATING THE ASSUMPTIONS

The built environment and, therefore, architecture have an impact on people (Hertzberger, 2005; Steg, Van Den Berg and De Groot, 2013; Barrett, P. Treves, A., Shmis, T., Ambasz, D. and Ustinova, M., 2019).

Childhood development is affected by contextual and cultural influences, but there are universal aspects of human nature and how children develop that can be applied regardless of these contextual influences. This allows research and practice from Western cultures and developed countries, with different contextual influences, to be applied to the South African context.

The research recognises the differences in the experiences of the environment by adults and children (Kennedy, 1991; Mergen, 2003; Dudek, 2005; Day and Midbjer, 2007).

The development of an ECD policy framework that includes a greater focus on quality and a context-specific design of the physical learning environment will positively impact children's quality of care and education.

1.3.4 DEFINTION OF TERMS

Transformation: “A change or alteration, especially a radical one” (Collins English Dictionary, n. d.).

In South Africa, it is a national strategy aimed at attaining national unity and promoting reconciliation through negotiated agreements and non-racism (National Planning Commission, n. d.).

In relation to this research, transformation (Department of Social Development, 2015) is based on the concept of early intervention (Heckman, 2016), which is seen as a mechanism to change the trajectory of a child born into a disadvantaged situation. ECD centres provide a

potential platform where children can develop holistically, moving the notion of ECD beyond mere child care to development and learning (Ashley-Cooper and Atmore, 2013).

Early Childhood Development: An integrated concept that cuts across multiple sectors, including health and nutrition, education, and social protection, and it refers to young children's physical, cognitive, linguistic, and socio-emotional development. The definition of ECD includes children up to age eight on the premise that a successful transition to primary school depends not only on the child's school readiness but also on the readiness of schools to adapt to the specific needs of young learners in the early grades. ECD is also known as early childhood care and development (ECCD) and encompasses early childhood education (ECE), early childhood care and education (ECCE), and other designations. (UNESCO International Bureau of Education, 2006; Martinez, Naudeau and Pereira, 2012; Department of Social Development, 2015).

ECD Centre: The place (building/premises) that provides admission, protection, and care for young children. The care usually includes an early learning programme in line with the policy of a given country (Department of Education [DoE], 2001).

Learning Environment: The complete physical, social, and pedagogical context in which learning is intended to occur (Bernard, 2012).

Learning environment refers to the diverse physical locations, contexts, and cultures in which students learn (Lippman, 2010b; Kokko and Hirsto, 2021). Since students may learn in various settings, such as outside-of-school locations and outdoor environments, the term is often used as a more accurate or preferred alternative to the classroom, which has more limited and traditional connotations—a room with rows of desks and a chalkboard, for example.

The term also encompasses the culture of a school or class—its presiding ethos and characteristics, including how individuals interact with and treat one another—and how teachers may organise an educational setting to facilitate learning. For example, by conducting classes in relevant natural ecosystems, grouping desks in specific ways, decorating the walls with learning materials, or utilising audio, visual, and digital technologies. And because a wide variety of factors determine the qualities and characteristics of a learning environment, school

policies, governance structures, and other features may also be considered elements of a 'learning environment' (Lippman, 2010b; Kokko and Hirsto, 2021).

Responsive: A responsive design approach develops an in-depth understanding of the end users' needs, considers what will occur in places, and considers the uniqueness of each site and context in a design process that includes a research phase (Lippman, 2010b; Kokko and Hirsto, 2021).

Responsive Learning Environments: These are tailored to meet each child's developmental levels, needs, cultures, and interests. In architectural terms, RLE refers to learning environments designed to respond to the inhabitants' needs and respond to the geographical, social, educational, and cultural context (Dierkx, 2002; Cloete, 2016).

Developing Countries: "Although various organisations use different measures to determine how countries are classified, there are a few common denominators that appear in the mix. For instance, Brazil, Russia, India, China, and South Africa (BRICS) are generally considered developing countries" (https://www.thebalance.com/what-is-a-developing-country-1978982).

Learning Environment Research: This refers to research focusing on "the social, physical, psychological, and pedagogical contexts in which learning occurs and which affect student achievement and attitudes" (Springer.com). The field is multidisciplinary and includes educational, psychological, geographical, and architectural research.

Evidence-Based Design: This is a practice of architecture that originated from research-based, or the more common evidence-based approaches found in medicine and other related disciplines. EBD is well established in health care design and is slowly gaining traction in different spheres, such as workplaces and learning spaces. The focus of EBD is tending towards design approaches that consider how the inhabitants experience their physical environments.

Mosaic Approach: This is an approach to research with children developed by Allison Clark. It combines a range of qualitative instruments such as photographs, tours, and maps with interviews and focuses on group discussions with children and their carers or teachers in an ECD setting. The focus of the approach is to give a voice to children (Clark, 2007).

Quality Early Childhood Development: The term is difficult to define as often the contextual lens impacts what is understood to describe quality. “It is widely accepted that if ECD input is to have any lasting positive impact on children’s development and learning, quality (whatever it might mean) is key to improving the health, as well as the cognitive and socio-emotional development of young children” (Excell, 2016, p. 1).

For the purpose of this research, quality ECD is considered to provide for the holistic development of a child in order to ensure a positive trajectory towards schooling and socio-emotional development.

Quality Learning Environment: Learning environments directly and indirectly influence student learning, including their engagement in what is being taught, their motivation to learn, and their sense of wellbeing, belonging, and personal safety. For example, learning environments filled with sunlight and stimulating educational materials would likely be considered more conducive to learning than drab spaces without windows or decorations, as would schools with fewer incidences of misbehaviour, disorder, bullying, and illegal activity. How adults interact with students and how students interact with one another may also be considered aspects of a learning environment. Phrases such as “positive learning environment” or “negative learning environment” are commonly used in reference to a school or class's social and emotional dimensions (https://www.edglossary.org/learning-environment/).

1.3.5 REFLECTIONS ON THE RESEARCH PROCESS

Since embarking on this research project in 2019, several changes have occurred in terms of the context of the research. The COVID-19 pandemic impacted dramatically on the daily operations of the ECD sector as well as access by outsiders to conduct research. The original project included a strong focus on children as participators in the research; however, due to the restrictions of the pandemic, their direct participation had to be kept to a minimum. Thus, the interaction that occurred at three of the research sites was used as a pilot study for this research, recognising the potential of the process. The section below provides a brief overview of the mosaic approach to including children in the architectural research and potentially a participatory design process.

A further major change was the move of the ECD sector's early learning component from the Department of Social Development to the Department of Basic Education. This move initiated a national ECD audit (Department of Basic Education, 2022b) and the development of the Thrive to Five Index, which set out to establish if children attending ECD centres were developmentally on track. During the initial stages of my research, the limited amount of reliable data on the context of ECD in South Africa indicated a substantial lack of information. In many ways, the limited reports and data have provided confirmation of the research problem and validated the need for the interventions suggested in the findings.

The research process included conference presentations in 2022, 2023 and 2024 as noted in Appendices A.3. These presentations enabled feedback and discussion about the concepts, research problem and data analysis processes. In November 2024 one peer reviewed article (Cloete, 2024) was published which was based on my presentation at the 2nd International Inclusive Cities Conference 2023.

MOSAIC APPROACH TO THE PARTICIPATION OF CHILDREN: THE PILOT STUDY

The mosaic approach (Clark, 2010a), a children's rights-based approach, was specifically developed to understand how children experience their environments. The research instruments included interviews, participant drawings, and narrative documentation of their experiences. The proposed methodology focused primarily on visual methods and included the mosaic approach developed by Allison Clark (Clark, 2010a; Lancaster and Kirby, 2010; Mitchell, 2011). This approach is specifically appropriate when working with children and includes various instruments such as observations, interviews, tours, picture/bookmaking, map making, and slide shows. The range of research instruments recognises the different languages that children (and adults) may use to communicate their understanding and views. The range of data forms is carefully combined in a participatory manner to develop a mosaic.

The data collection included three child participants at three of the research sites, totalling nine child participants. The principals and teachers selected children for the participatory work but were dependent on gaining parental consent and the children's assent. Each session included a child-led tour of and conversation about their school that was video-recorded, a

drawing exercise, and a discussion where three images of learning environments were shown and the children shared their preferences.

- The recorded data was transcribed to include descriptions of how the interactions took place.
- Still images were taken from the video recordings to create a story.
- Tour routes/movements were mapped on a school plan, with identification of preferences.
- The selection of school examples was transcribed.

The analysis process focused on emerging themes from each site's data, followed by combining the analysis of the three data sets.

The review of the participatory process and analysis indicated that effective child participation required a longer time frame for engagement. The literature similarly speaks of several visits to a research site, which will enable the researcher to build a relationship with the children (Clark, 2007; 2010a; Botsoglou *et al.*, 2019). As discussed in the reflection on the impact of the COVID-19 pandemic, the empirical data collection had to be contained to two visits, with only one visit with the children present. In terms of this constraint, the participation of children in this research project has been contained to the pilot study. A further constraint was that the engagement with children needed to be in their mother tongue, which was isiZulu in this instance. The financial constraints of the study did cater for the appointment of an additional research assistant who was fully conversant in their language. However, the pilot study indicated how children's participation could be included in future learning environment research projects and in a co-design process for the development of ECD infrastructure.

1.4. CONCLUSION

1.4.1 SUMMARY

The chapter developed an argument for the investigation into the relationship between early childhood development (ECD) learning environments and the transformation of ECD in South Africa.

The research problem was defined and considers how limited recognition of the relationship between quality childhood development and quality learning environments in the South African policies that support early childhood development impacts the potential of ECD transformation. The research problem considers how this oversight has led to the implementation and development of early childhood development policies that disregard the potential quality generated through responsive approaches to learning environment design. Responsive ECD learning environments are child-centred, actively contribute towards pedagogy, and form part of the broader community ecosystem of a learning environment.

The research questions how responsive learning environments can contribute to early childhood development transformation in South Africa and what strategies should inform the revision of ECD policy in South Africa.

The chapter further provided details of the research aim and objectives, as well as the primary and secondary questions. The scope of the study was established to be contained in the discipline of architecture in relation to early childhood development policy and learning environments. The research problem and scope of the study were provided from an international perspective and contextualised to be applied to a multiple-case study situated in the Outer-West region of eThekwini in the province of KwaZulu-Natal, South Africa.

The conceptual framework of the learning environment, early childhood development, and transformation was introduced in relation to the research problem. Figure 1-10 illustrates this conceptual framework, which considers the interrelatedness of ECD and responsive learning environments towards potential transformation (top of fig.). The research is furthered through the literature review (blue boxes) and the theoretical framework (listed in textboxes to relate to the literature) of the study. Chapter Two, the literature review, is summarised in the three blocks with the headings: Environment and Behaviour, ECD LE, and ECD and Policy. The main bodies of literature utilised in each of these sections are also identified.

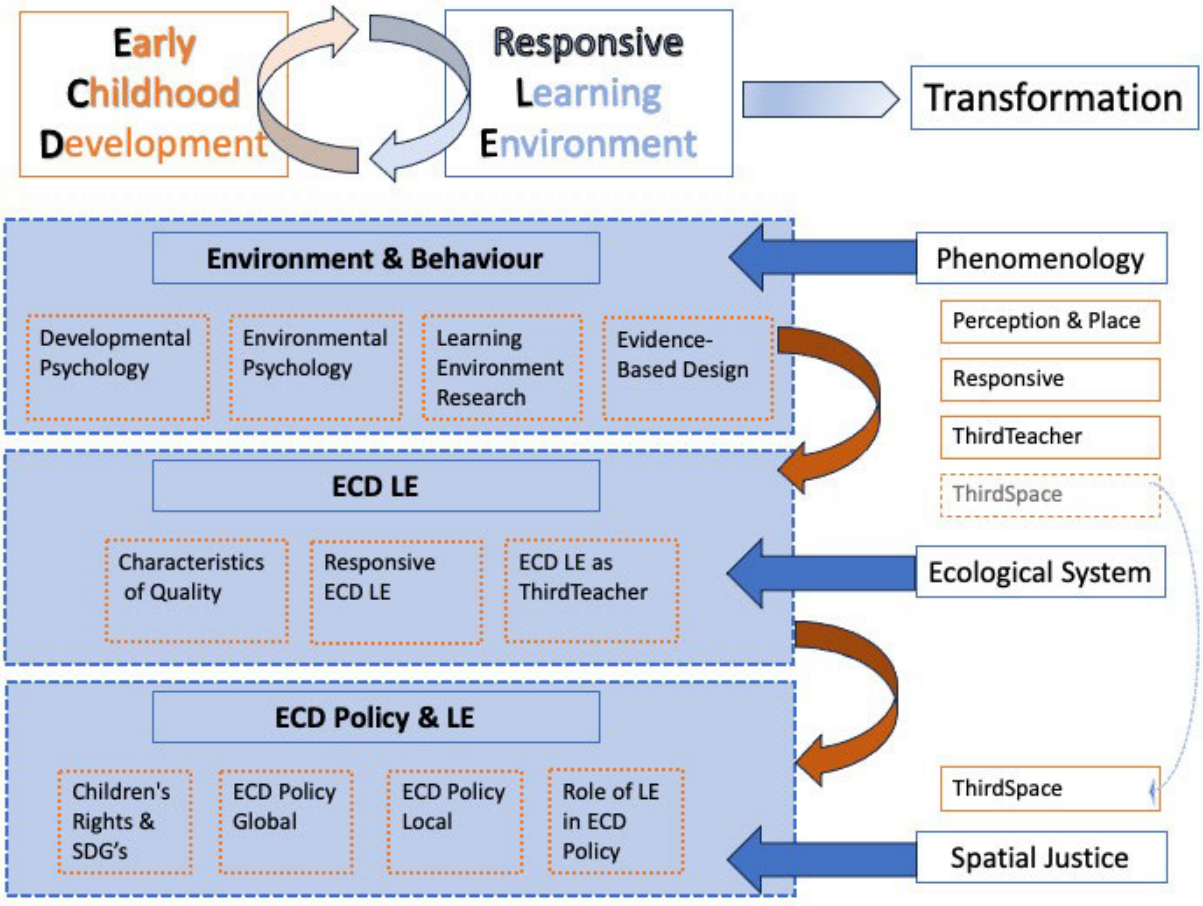

Figure 1-10 Conceptual Framework with Literature and Theories

Source: Author (2023)

1.4.2 STRUCTURE OF THE DISSERTATION

The dissertation is structured into eight chapters. Chapters 1 to 3 form the basis of the study, as they provide the introduction, the literature review, and the theoretical framework. Chapters 4 to 6 provide the methodology, the presentation of the case study, and the presentation of the findings. Chapters 7 and 8 provide a discussion of the findings, the conclusion, and the recommendations. This is followed by the list of references in the bibliography and the appendices at the end of the dissertation.

Chapter One

The research study has been positioned using the role of architecture in shaping people's lives and the critical concept of early intervention in early childhood development towards

transformation of this early development. The research motivation, problem, aims, objectives and questions have been provided. The scope of the study has been outlined, and the chapter ends with an illustration of the conceptual framing and how literature and theories support the study. The structure of the dissertation has been provided.

Chapter Two

The literature relating to the research problem is reviewed under the following key headings: Environment, Behaviour, and ECD; Seeking a Quality ECD Learning Environment; and ECD Policy and Learning Environments. The literature could have been separated into three smaller chapters. Instead, the literature is divided into three distinct sections that build on each other.

Chapter Three

The chapter includes a detailed review of the theoretical framework of phenomenology, considered through place and perception, and this is followed by the ecological systems theory. The conceptual framework of social and spatial justice concludes the chapter. The combination of these theories provides the research with a lens to understand the complexity of embodied space.

Chapter Four

The research methodology and approach are mapped out in this chapter. The research design of the multiple-case study is discussed, with details of the range of data collection methods explored. The approach to the data analysis is included, as are the ethical considerations of the study. The methodology combines a range of approaches due to the interdisciplinary nature of the work, which moves between education, psychology, and architecture.

Chapter Five

The multiple-case study sites are introduced in the context of ECD in South Africa. Each of the eight sites is included, with descriptions and illustrations to situate the data collected in each unique context. The diversity inherent in the study is captured.

Chapter Six

The empirical data from the case study is presented, showing the analyses and findings from the different data sets. The findings include a multi-layer thematic analysis that considers the quality of the physical and holistic learning environments. This is followed by a presentation of the perceptions, observations, and voice data that document the experiences in the learning environments and their development. The multi-methodology of the study is presented systematically to move from the physical into the embodiment of space.

Chapter Seven

This chapter includes a discussion of the findings in relation to the literature and the theoretical framing of the study. The findings provide critical strategies for the transformation of ECD learning environments. The chapter extends to acknowledge the scope of the study's limitations and the potential to extend the research.

Chapter Eight

The conclusion and recommendations chapter reviews the arguments and findings in relation to the research problem, scope, and research aims set out in Chapter One. The research extends to providing recommendations for practice and potential future research. The contribution of the research to the body of knowledge on the subject matter is highlighted, and the limitations of the study are also discussed.

Bibliography

The references included in the research are listed alphabetically according to the Harvard referencing system used in the study.

Appendices

The appendices provide the ethical clearance documentation, examples of the research instruments, and a list of the research outputs.

2. CHAPTER TWO – LITERATURE REVIEW

2.1 INTRODUCTION

The literature review provides a foundation for the research and addresses the aim of the study: To explore the relationship between responsive learning environments and early childhood development policy transformation in South Africa. The first two sections explore research sub-question 1: What is the relationship between ECD transformation and the ECD learning environments? And sub- question 2: What is the relationship between the quality of the ECD and the quality of the ECD learning environments? The last section of the literature moves to focus on the policies used to explore research sub-question 3: What is the status of ECD transformation in post-Apartheid South Africa in the context of local and global Sustainable Development Goals? And sub-question 6: How does the South African policy framework impact the quality of ECD learning environments?

The literature review follows a thematic approach as a means to consider the key concepts and research questions, while also providing the state of the art in the field and considers approaches to studying environment and behaviour and early childhood development (ECD) and their relationship to policy. The first theme provides a brief review of the discipline of environmental psychology to set the scene for an investigation of learning environment research, followed by a brief review of the practice of evidence-based design. The underlying focus of these sections remains on the child and ECD while providing a broader scope of research in the field.

The second central theme, seeking quality ECD learning environments, provides a review of research specific to the environments where young children between the ages of 0 and 5 years are cared for and educated. The underlying concept of quality seems to be the driving force behind learning environment research and post-occupancy evaluations. Therefore, the review investigates the thematic components emerging from the research relating to quality, namely: the characteristics of quality ECD LE; determining the parameters for responsive ECD learning environments; and the pattern language for ECD LE.

The third and final theme relates to the research problem through the investigation of the concept of transformation in ECD learning environments and the policies for ECD and learning environments, as found globally and in the context of South Africa. The literature includes an exploration of ECD in democratic South Africa since 1994, as well as the relationship between policy and learning environments. The concluding section provides an overview of the literature, highlighting theoretical approaches and methodological approaches and identifying gaps in the literature in relation to the aim and research questions.

The methodological approach to the literature review is qualitative. The search for and review of the literature extended from the initial inception of the study to the narrowing of the research topic. The search criteria were widened as the research unfolded and new concepts emerged, and the search continued during and after primary data collection and analysis and into the writing stage of the project. Various search engines and several online databases were used, and a range of keywords in multiple combinations were included. Snowballing of the literature sampled occurred throughout the process, as literature references and bibliographies were consulted to find further relevant research. Although the approach to the initial selection was broad, the narrowing of focus occurred through a detailed reading of papers, chapters, and books. The searches reached saturation when the same studies were found repeatedly. Patterns and repetitive themes emerged from the research, leading to theoretical, conceptual, and methodological approaches to the research project. The literature of each theme and concept was analysed critically to integrate the various themes and concepts individually while also developing connections between them and searching for connections in the context of the research project.

2.2 ENVIRONMENT, PEOPLE (CHILDREN) AND LEARNING

In response to objective number 2: To determine the relationship between ECD transformation and ECD learning environments, this section is positioned in architecture and aligned with literature from three domains, namely environment and behaviour, environmental psychology, and learning environment research, as illustrated in Fig. 2-1. Each of the sections presents similarities and differences in terms of the theoretical lenses and methodological approaches and narrows from the broad grounding of the domain to the specifics relating to young children and their development. The evidence presented confirms

the role of quality environments and the contextual predominance of voices from the Global North.

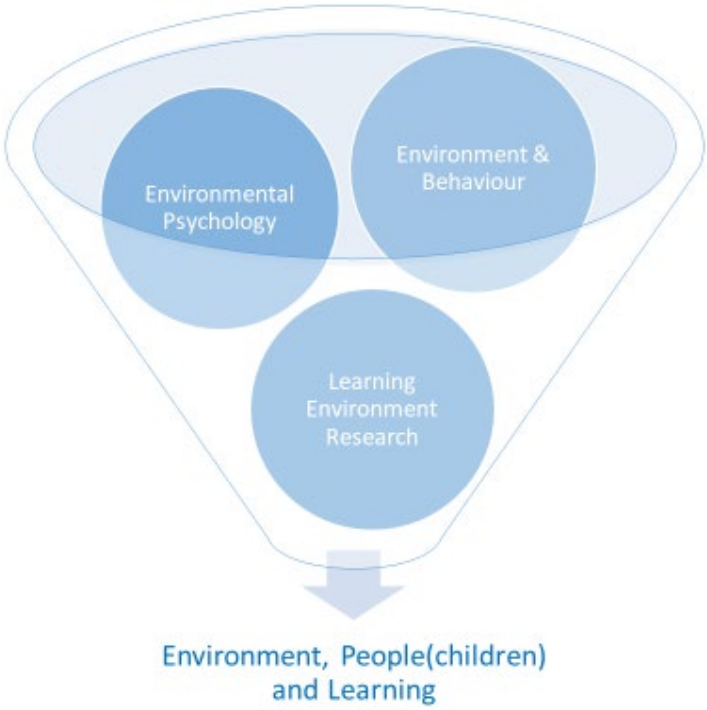

Figure 2-1 Positioning the Literature

Source: Author (2023)

2.2.1 ENVIRONMENT AND BEHAVIOUR

In the broadest sense, this research project investigates the relationship between architecture and people within the context of learning settings. This relationship between us and our surroundings has been debated and investigated over time, with various architects and theorists contributing to its understanding and practice (Rasmussen, 1959; Rapoport, 1990; Day, 2004; Hertzberger, 2005). The role of architecture in serving society is at the core of this discussion, where we acknowledge the impact of every design decision on those who inhabit or frequent the spaces and built form (Lucas, 2016). Commonality has been found in the writings in the disciplines of architecture (Rasmussen, 1959; Zeisel, 1984; Rapoport, 1990; Day, 2004; Dudek, 2005; Hertzberger, 2005), psychology (Proshansky, Ittelson and Rivlin, 1970; Canter, 1974; Seamon and Mugerauer, 1985; Gibson, 1986; Kopec, 2018), geography (Relph,

1976; Soja, 1996; Massey, 2005), and urban studies (Jacobs, 1961; Alexander Ishikawa, Silverstein, Jacobson, Fiksdahl-King and Angel, 1977; Gehl, 2010; Sussman and Hollander, 2015) when seeking to understand how people relate to their environment and why, and how the design of environments can contribute to improving people's lives. The term 'environment' represents the physical environment, meaning both built and natural environments, and the socio-cultural environment, depending on the focus of the study. However, it is evident that the physical and socio-cultural environments are intertwined, and it is difficult to study them separately (Stokols, 1978; Garling and Golledge, 1993). This concept of the environment aligns with the approach taken for this research, as set out in the definition of the learning environment as a critical concept and elaborated on in Chapter One.

When examining the multidisciplinary seminal works, I found some studies that focused directly on children and their development (Dudek, 2005; Day and Midbjer, 2007), and other studies where a reflective approach was taken and children were studied to understand the way that adults experience their surroundings better (Rasmussen, 1959; Tuan, 1977; Rapoport, 1990). Chawla, Cushing, Malinin, Pevec, van Vliet and Zuniga (2019) connect attention to children's everyday experiences to the romantic literature of the 18th century and note increased concern for children's welfare due to the harsh conditions of industrial cities and anthropological studies around children's lives in various contexts globally. However, since the 1970s, there has been an incremental increase in scholarship investigating the relationship between children and their environments in the fields of human geography and environmental psychology (Mckendrick, 2000; Chawla *et al.*, 2019).

Rooted originally in developmental psychology (Bronfenbrenner, 1979), the literature review extended into childhood studies and children's rights. The discourse led to an approach of otherness that is affiliated with the feminist paradigm and includes children and youths up to the age of 25 (Chawla and Van Vliet, 2017). Critical to the feminist paradigm is the view of children as 'agents with a voice' to be heard within research and in relation to decisions about their environments (Holloway and Valentine, 2000; Kraftl, Horton and Tucker, 2014). The research includes children's geographies and considers their conceptual position in society and how it manifests in the physical space and place of the home, school, street, park, and virtual space (Mckendrick, 2000; Kraftl *et al.*, 2014).

Contradictory to the debate is the inherent polarisation of adults and children and how each relates to their environs, as if two different species (Holt, 2010). The critical position of the school as a place and institution is acknowledged in multidisciplinary approaches to childhood environments (Kephart and Aries, 1966). This has led to an increasing body of knowledge about the school as a children's environment that is distinct and separate from that of adults. However, it is noticeable that enquiries into early childhood environments are relatively limited compared to those concerning primary and secondary school environments (Alegre and Allweil, 2020).

The environment and behaviour discourse includes both built and natural environments. The tendency to focus on urban environments is noticeable in the earlier works that criticised modernism's disregard for histories, cultures, and people's daily needs (Stokols, 1995). This discourse has continued due to the global concern about the quality of life and urbanism, with some studies specifically focusing on children's positions in a city (Smithson, 1968; Lynch, 1977; Ward, 1978; Chawla, 1997; 2003; Fleury-Bahi, Pol and Navarro, 2017). More recently, the focus has shifted to the natural environment in line with growing concerns around the depletion of our natural resources and the broader debates related to environmental sustainability (Palmer and Neal, 1994; Bechtel and Churchman, 2002; Palmer, 2003; Steg, , L., Van Den Berg, A. E. and De Groot, J. I. M. (eds.), 2013). Central to the relationship between people and the natural environment lies our natural affinity and inborn need for connectedness to nature, as theorised in the discourse on biophilia (Kellert and Wilson, 1993). The importance of nature during childhood and the detrimental outcome when nature is lacking are pivotal to this argument.

Biophilic research and design focus on our natural affinity for nature, incorporate the therapeutic qualities of nature, and are specifically related to health care environments. More recently, the role of nature awareness and biophilic design has been investigated at the city level (Ulrich, 1983; Chawla, 2012). This knowledge has extended to the role of nature in schools and ECD centres, with a focus on the potential freedom of play, the potential for learning, the appreciation for nature, and the need for protection of the natural environment (Derr and Lance, 2012; Mawson, 2014; Deaver and Wright, 2018; Dennis, Kiewra, Slater and Boulton, 2018; UNESCO, 2021).

In architectural discourse, Rasmussen (1959) argues for a humanistic approach where the experiences of a building's end-user become the drivers of its design. Similarly, the seminal works of Jacobs (1961); and Alexander *et al.* (1977) relating to the urban condition stem directly from the study of how people make and inhabit their environs. These studies are related to the philosophical approaches of phenomenology (Heidegger, 1971; Seamon and Murgerauer, 1985; Merleau-Ponty, 2002) and critical theory (Lefebvre, 1991; Foucault, 1994), as well as the critical human geography discourse posited by Soja (1989) as the most pertinent to this environment-behaviour focus. An in-depth discussion of the theoretical discourse and how it unfolds in relation to ECD learning environments in South Africa will be provided later in the dissertation; however, picking up the thread associated with the psychology of the environment and behaviour is relevant as it forms the basis for most research dealing directly with children and their learning environments (Lucas, 2016).

This broad review of the field of environment and behaviour and the sub-field of children's environments indicates the prominence of research in the contexts of Western Europe and the United States. However, the review indicates that there is a need for research on this from the Global South. Over the past decade, there has been a marked increase in studies dealing with the vulnerable communities of Asia, South America, and Africa. International perspectives by Holt (2010) on children's geography do contribute to the field as they relate to studies based in Ghana, Singapore, and Mexico. A review of the contributing authors of these studies indicates that most of the scholars working in the field are situated outside of these contexts or received their education abroad. Ferguson, Cassells, MacAllister and Evans (2013) conducted an international review of physical environments and child development, and they recognised the limited research from the Global South and questioned the validity and appropriateness of methodologies rooted in Western contexts. Their study proposes a holistic approach based on Bronfenbrenner's (1979) ecological model, with active interrelationships among the disciplines at various levels. Their approach includes international collaboration involving multiple stakeholders, including governments and the local communities. Holloway and Valentine's (2000) argument about the interrelation of local and global contexts being proposed as an embedded system concurs with Ferguson *et al.* (2013); and Bechtel and Churchman (2002), suggesting that the embedded systems approach

leads to contextualised scholarship. The ecological systems theory will be discussed in more depth in Chapter Three as part of the theoretical framework.

However, it is critical when examining the transformation of ECD learning environments to consider the child's environment-behaviour relationship from a developmental psychology and neurobiology research perspective. In his seminal text, Canter (1974) argues that child development is critical to the design of the built environment. He provides two perspectives: the difference between children and adults and the requirement for buildings (environments) to support the various ways in which the developing child can be supported on their journey towards adulthood. Day (2007) builds on the same argument regarding the differences between children and adults. These authors and other architectural researchers (Sanoff, 1995b; Dudek, 2005; Nair and Fielding, 2005; Hertzberger, 2008; Lippman, 2010b; Barrett, Davies, Barrett and Zhang, 2017) associated with architectural design for children work from the assumption that the environment that a child finds themselves in impacts directly on their development. This refers to the preceding discussion on the inherent connectedness between people and their environment. The role of the environment in child development is often referred to as the nature versus nurture debate, and various studies have attempted to find a balance between innate development and the role of the holistic environment in influencing the outcome of this balance (McCartney and Phillips, 2008; Lowe, 2012).

In Chapter One, we established the critical role of enabling positive childhood development and the impact of ECD environments on this role. The key themes from developmental psychology discussed by Canter (1974) in relation to architectural psychology for children are taken from the work of Piaget (Piaget and Inhelder, 1969). The key themes to be considered are the developmental stages, perceptual development, assimilation and accommodations, and environmental deprivation. The trend to refer to the theories of Piaget in the first instance could be ascribed to the focus on cognitive development and the consequential stages of development rather than the growth of a whole child within a specific context (Babakr, Mohamedamin and Kakamad, 2019). In her critique, Penn (2008) considers the concept of development as a linear process from birth through various stages into adulthood to be questionable. One of the critical concerns that Penn (2008) raises is the oversimplification of key theoretical approaches in their application to policy and practice related explicitly to ECD

provision. This view of developmental psychology emphasises the incredible complexity of how life presents itself to children in a multiplicity of layers and fragments.

My research is inherently complex and aims to understand the environment-behaviour relationship with ECD within the unique context of ECD centres in South Africa. Moving forward, I present, analyse, and critique the approaches developed within the discipline of environmental psychology towards understanding and framing the broad field that my research project is set in.

2.2.2 ENVIRONMENTAL PSYCHOLOGY

Leading the way in the search for an understanding of the environment-behaviour relationship, the discipline of environmental psychology's body of knowledge expanded exponentially in the late 1970s through conferences and the publication of research in books and journals (Stokols, 1978). The discipline found three distinct levels of inquiry, identified as follows: firstly, the most fundamental human processes that filter our experiences through perception, spatial cognition, and personality; secondly, the management of physical and social settings within the complexities of everyday life, including aspects such as crowding, privacy, territory, and personal space within the work, life, learning, and play environments of adults and children; and thirdly, our interconnectedness and engagements with nature and the depletion of natural resources and species through climate change (Gifford, Steg and Reser, 2011). However, the field tends to leak into other domains of psychology, social studies, and architecture, and there is also some collaboration with geographers (Garling and Golledge, 1993; Giuliani and Scopelliti, 2009). Although these domains share the core of understanding the environment-behaviour relationship, this diversity allows for some confusion and a variety of foci, making it difficult to define. It is noted by Stokols (1978) that earlier research tendencies tend to isolate the physical from the broader understanding of the environment, and Gifford *et al.* (2011) provide an example of this by referring to investigations of noise and heat and their impact on work performance. This tendency is in line with the architectural domain, where the physical parameters are measurable and can be addressed more concretely within the design process. The continued connectedness between architecture and environmental psychology can also indicate the continuing trend towards user-centred design, which is also evident in the recent direction of evidence-based design practices (Giuliani and

Scopelliti, 2009). Similarly, there seems to be a preference for a more scientific approach to methodology and developing solutions, leading to the position of environmental psychology as an applied discipline (Gifford *et al.*, 2011). This position of applied knowledge strengthens interdisciplinary scholarship with architectural and educational research and praxis.

The most recent focus of environmental psychology relates to the relationship between people and their environment (built and natural) towards the sustainability of our planet while simultaneously preserving human well-being (Steg *et al.*, 2013; Clayton, 2020). Giuliani and Scopelliti (2009) emphasise the interaction of the disciplines of architecture and environmental psychology in terms of place-specific research within this broader concern of sustainability. Within the scope of sustainability, a parallel approach considers the quality of life in a broad range of contexts, from the enclosure of the bedroom to streets, neighbourhoods, urban environments, and beyond. However, the concept of quality of life has been integrated within environmental psychology as part of the psychology of sustainability (Gifford, 2007). In a parallel argument, Bechtel and Churchman (2002) argue for a holistic framework for understanding the complex human-environment relationship. This approach assumes that context(s) are representative of a holistic environment and the interaction of the person-in-environment system. The system's understanding of context(s) can be directly related back to the triple bottom line of sustainability, where we recognise the interrelation of economic, social, and environmental constructs. Similarly, this holistic view relates to the ecological system of human development as developed by Bronfenbrenner (1979), confirming children's position within the sustainable psychology discourse.

The position of children within environmental psychology research is mainly represented by studies relating to specific typologies, such as residences, schools, and hospitals (Giuliani and Scopelliti, 2009; Ferguson *et al.*, 2013). The exploration of children and healthcare environments relates to the potential for how the physical environment can assist or hinder the process of healing. Research pertaining to healing environments is rooted in phenomenology and a psychological theoretical base, providing a more holistic perspective on healthcare. The scoping review by Gaminiesfahani, Lozanovska and Tucker (2020) of research on paediatric healthcare and the impact of the physical environment on child health and well-being confirms the relationship between children and their environment. Their research also

distinguishes between childhood experiences and adult experiences, thereby acknowledging the requirement for research and praxis specific to the children's environments.

However, the concept of well-being is further explored within environmental psychology to consider how children relate to a given context. Bechtel and Churchman (2002) provide a different definition of context as part of the person-in-environment system. The term 'context' includes the range of physical, social, and cognitive contexts and development that are not contained in the domain of children. The review of children's environments by Korpela (2002) focuses on the concept of place and how places affect psychological well-being and potentially healthy development. For children, a place is distinct from other spaces, meaning that a particular value is awarded to the place. Children gravitate towards a place, not only in terms of its aesthetic characteristics but more so in terms of what it affords. The study by Min and Lee (2006) investigates neighbourhoods experienced by children between the ages of 7 and 9 years, and the findings on how children come to value places provide insight into how children relate to their physical environments. It is important to note that children can clearly identify their preferences and the reasons for their value of certain places. The authors identify the core attributes of children's places to include spatial, physical, and social aspects. Furthering the argument for the relationship between behaviour, affordance, and place, their research considers how children transform space into a meaningful place through their creative, purposeful, and social play activities. Similarly, earlier research by Wilson (1997) considers the role of place in the development of children. Critical to his views is comparing the child's environment to their cultural setting, which shapes the adults they become. In the child's environment, we can distinguish between those providing a setting for positive development and those not doing so. Wilson (1997) describes the sense of place as those spaces that enable nesting, exploration, the potential for change, and inciting memory. Referring to Olds (2001), he defines these places as having the potential to house children. A child-friendly place that invites exploration and a sense of belonging is in stark contrast to a lifeless institutional space, which indicates that children's unique needs are not understood or supported (Sanoff, 1995b; Wilson, 1997).

The concept of dwelling in an architectural place is further elaborated on in the theoretical section of Chapter Three. However, the notion of a sense of place and the potential for

belonging (dwelling) is a repetitive theme recommended by educational experts and architects alike and investigated by environmental psychology. Fewster (2015) considers the notion of 'my place' to be of particular importance to babies and toddlers, where the exploratory sensory-based learning of younger children can be awakened and enabled in a learning environment that provides belonging. However, research indicates that the attitude of teachers is a different determinant of the potential for learning through exploration (Fredriksen, 2012). In settings where the child's right to self-directed learning is established, the inherent freedom enables the positive potential of the learning environment to determine a different outcome than that in more controlled settings (Dewey, 1958). The architect and theorist Simon Unwin (2019) postulates that children exhibit a natural ability to create a place. He relates spatial relations to a language where the way we organise, adapt, and make our physical surroundings establishes a dialogue between people and their environment. His view traces a child's development from the first dwelling in the womb and continues the journey of connectedness with his/her environment.

Critical to Unwin's (2019) argument is his critique of the general disregard for the spatial component of child development, leading to research that tends to focus more on measurable criteria and variables within the physical environment that relate to health and safety, as confirmed by Bernard (2012); and Berti, Cigala and Sharmahd (2019). The role of environmental psychology in preschool settings is investigated in a review by Ata, Deniz and Akman (2012). Four factors that determine the physical environment are identified in their study, namely: space, noise, air conditions, colour, and lighting. These are listed as critical determinants of the quality of the physical environment. Although these factors are valid and relevant, the focus seems narrow, only touching on essential, tangible elements. This approach stands in contrast to authors with a more qualitative approach and research rooted in the conceptions of place and perception (Berris and Miller, 2011; Arndt, 2012). Green and Bryant (2011); and Anbari and Soltanzadeh (2015) similarly refer to special places and their significance to children, using participatory methods to enable the voice of children. Their research originated in a preschool but then extended to children's home environments and acknowledged the connection between home and learning environments for children.

Qualitative approaches were also explored in the environment-behaviour domain by Zeisel (1984), as presented in his seminal text, "Inquiry by Design: Tools for Environment-Behaviour Research". He used the approach of observation, and this approach originates from anthropological studies, where a researcher would spend a significant length of time in a research field. The methodology enables the researcher to understand behaviour in its natural setting. Some of the tools include photography, sketches, note taking, and observing physical traces. Sahoo and Schmidt (2020) recently extended this approach by using the theoretical underpinning of phenomenology and considering how environment-behaviour observations are focused on embodied behaviour. However, in terms of architectural research, Lucas (2016) positions observational studies in both environmental psychology and phenomenology, where the latter focuses on sensory notation. The acknowledgement of phenomenology as the theoretical or philosophical root of environmental psychology confirms the theoretical stance of my research study. The different approaches to environment-behaviour research are of particular relevance to the development of studies investigating how the design of learning environments impacts the education of young children through to adulthood.

2.2.3 LEARNING ENVIRONMENT RESEARCH

As discussed in Chapter One, the term '**learning environment'** describes the milieu or place of education. In the comprehensive review of research on learning environments commissioned by UNESCO, Bernard (2012) defines a learning environment as the complete physical, social, and pedagogical context in which learning is intended to occur. This understanding of a multi-layered environment and its influence on learning and development is rooted in the educational approaches to active learning of Dewey (1916) and connected to the constructivist approaches to developmental psychology of Vygotsky (Langford, 2005) and the ecological systems model established by Bronfenbrenner (1979). Learning environment research could be seen as a component of environmental psychology and is representative of the environment and behaviour discourses; however, the scope of the field is much broader as it includes curriculum, pedagogic approaches, and educational planning (Blackmore, Bateman, Cloonan, Dixon, Loughlin, O'Mara *et al.*, 2011; Fraser, 2023). Similar to environmental psychology, we find a multidisciplinary representation that includes education, psychology,

architecture, and interior design, as well as sociology and health sciences (Blackmore *et al.*, 2011).

The potential of learning environment research (LER) is that it explores the spaces where learning takes place in a holistic manner, bringing together the physical, social, and pedagogic realms. However, the most recent reflective review of LER by Fraser (2023) indicates a predominance of evaluations focused on the social and pedagogic realms, with a more recent inclusion of physical spaces. Considering that his review seems to be based on his editorial position in the *Learning Environment Research Journal,* it could be misrepresentative of international trends. In contrast, the report by Cleveland and Fisher (2014) indicates an interest in the physical learning space since the 1980s and a marked increase in interest since the 2000s. The scoping review of the role of the physical environment in the psychological development of young children by Berti *et al.* (2019) similarly concurs with the increase in interest in this field over the past three to four decades. My own review of learning environment literature, rooted in the architecture domain, aimed to include a holistic understanding of the physical space, which meant that my search terms and process of selecting appropriate sources would have eliminated those sources that did not include the physical space. Considering the high number of papers that I obtained, my view is that there is a renewed focus on the physical as part of the evaluation of learning environments. There has been a shift from explorations of the architectural design of the standard classroom with rows of desks to more innovative learning communities in line with the exploration of innovative pedagogics for active learning (Nair and Fielding, 2005; Bradbeer, Mahat, Byers, Cleveland, Kvan and Imms, 2017). The interest in early learning environments has similarly increased over the past two decades, in line with the research acknowledging the potential positive impacts on society through quality ECD (Berti *et al.*, 2019). A further driver for explorations in new approaches to the design and evaluation of learning spaces is rooted in the concept of the 'third teacher', which acknowledges the interrelationships between the environment, pedagogy, and people (OWP/P Architects, VS Furniture and Bruce Mau Design, 2010; Hall, 2017; Robson and Mastrangelo, 2018). Incidentally, this argument is supported by Cleveland and Fisher (2014), who posit that the critical spatiality of the 'third space' has influenced this renewed focus on the physical.

The integration of the physical with the psycho-social in research is still limited, as the focus seems to consider how changes in the space impact the curriculum and outcomes rather than the experiences (Fraser, 2023). It is critical to acknowledge the multiple relationships that influence learning experiences and outcomes, both within and outside the learning environment. As discussed in Chapter One, the ecological systems approach provides a framework for understanding the complexity of human development. Blackmore *et al.* (2011) further the complexity of the learning environment with their application of the theoretical lens of the 'third space', according to Lefebvre (1991); and Massey (2005). The third space lens enables the inclusion of the social dimension. Blackmore *et al.*'s (2011, p. 3) approach criticises the linear conception of "learning spaces, their use, and student learning outcomes" to acknowledge further complexities of individual and collective physical, mental, and cognitive well-being. In parallel, Cleveland (2015) includes the theoretical approach of critical human geography developed by Soja (1989), where spatiality, temporality, and the social being represent the total human existence. Hence, the critical question of "whose space" emerges through this theoretical lens, initiating a refocus on the children and their experiences of the space.

The argument of socio-spatiality is applied to learning environments, more specifically schools, through the theory of behaviour setting (Cleveland, 2015). Behaviour setting theory compartmentalises the physical environment into units that bring together people, physical things, and spaces, and processes such as air movement or light transfer with activities (climbing, lying down, singing) that may occur. At the core of behaviour setting theory is the concept of affordance, as developed by Gibson (1986). This defines the qualities of physical objects and spaces and suggests or enables certain behaviours. Cleveland (2015) argues that this socio-spatial lens enables the distinction between space and place, which is required to evaluate learning environments rooted in a constructivist pedagogy. However, Lippman (2010a) criticises the constructivist approach as limiting the potential of the interaction between the learner and the learning environment to being one-directional, where the learner is active but the environment is passive. In his argument for a responsive learning environment through the lens of practice theory, the environment becomes active to enable change. Inherent in the notion of responsiveness are the principles of sustainability relating to environmental, social, and cultural considerations. This definition aligns with the concept of

responsiveness reported in my masters research (Cloete, 2016) as an essential strategy towards architectural design to enable early childhood development.

However, Matthews and Lippman (2020) have since focused on ECD learning environments using the constructivist approach and the concept of affordance as their lens, losing the notion of responsiveness that was key in Lippman's (2010b) earlier work. In their earlier work, Matthews and Lippman (2016) position the physical environment to mediate our social actions, acknowledging the active role of the physical. Their move away from responsiveness as a key concept is particular to early childhood learning spaces, where they propose that more structure is required. This approach is in contrast to the Reggio Emilia principles, where active learning extends towards actively shaping the environment, starting at the design process (Hall, 2017) and continuing through the pedagogy (Biermeier, 2015).

In the discourse on LER, there is an inherent distinction between formal learning environments, such as schools and universities, where teachers are tasked with education, and informal learning environments that include museums, public parks, libraries, neighbourhoods, and other spaces of incidental learning (Hertzberger, 2008). Further forms of learning environments include non-formal or semi-formal forms where urban spaces and other social spaces can be considered to provide learning opportunities (Alegre and Raikidou, 2023). One could argue that during the early years, when learning through play is predominant, the learning spaces do not strictly adhere to the requirements of formal learning environments and could in some ways lean towards informal or semi-formal places. Furthermore, measuring the outcomes of early childhood learning and development cannot be achieved through test scores, which in turn impacts how to measure the effectiveness or quality of the learning environment. The key focus of LER seems to be to assess, inform, and develop the quality of the education outcomes (Bernard, 2012; Barrett *et al.*, 2019). Cleveland (2015) narrows the aim of physical learning environments as measuring quality towards impacting policy while critiquing the effectiveness of the implementation of change.

A critical distinction from environmental psychology is that from the outset in the 1980s, the methodological approaches of LER engaged with participants through surveys and questionnaires (Fraser, 2023). Teachers and students at all levels of education are included in the studies to assess their perceptions of their learning environments. This approach has been

extended in the work of Lippman (2010b) in the US on the development of responsive learning environments rooted in what he describes as evidence-based design. The clever classrooms approach was established by Barrett *et al.* (2015) in the UK in their application of the SIN design principles to the holistic evaluation of primary schools. Both of these research approaches are rooted in architecture and include the participation of the users through questionnaires or interviews with observational data collection and architectural surveys, providing a comprehensive understanding of the various systems informing the quality of learning environments. In the domain of early childhood learning environments research, the mosaic approach to participatory design and evaluation developed by Clark (2010a) has been extended to various forms of engagement with children's voices. The commonality of these research approaches is found in the predominantly qualitative nature of the data collection and analysis and the combination of a range of research tools. These approaches bring together the experiential 'perception' of phenomenology of place with the socio-constructivist nature of the person-environment relationship of critical human geography in the concept of the third space. This has consequently provided this research with a methodological approach that is suitable for the complexity inherent in the ECD learning environments in South Africa. The interrelatedness of place, third teacher, and third space will be furthered in Chapter Three as part of the theoretical framing of the research. The application of the above methods and tools is detailed in Chapter Four.

The context of learning environment research is predominantly rooted in the developed world. Fraser (2023) notably refers to the scope of LE research published that does include developing countries, including South Africa, pointing out that these studies do not include the physical space in their focus. The lack of research from other African countries has thus been identified, along with the preference for research sites in privileged urban contexts. Abbas (2012), however, argues about the importance of research on children and environments as a driver towards development and countries ultimately achieving developed status. His argument is based on learning from the developed nations' lessons in terms of the relationship between people and their environment. The designer's role is emphasised as critical in providing appropriate environments specifically for children. The existing research methodology that has been tested in developed countries can be adapted and made suitable for research in developing countries. *A Place to Learn* (Bernard, 2012), commissioned by

UNESCO, provides a broad review of learning environments, with the primary aim of improving the quality of learning environments and a specific focus on the developing world. The aim and findings of this report are critical for the recognition of the diversity of learning environment typologies determined by their geographic context. This diversity requires an understanding of different research methods and tools. With a simultaneous view of the physical conditions, the psychological and social environment, school culture, and the climate, the complexity and interaction of a whole system are captured. The suggested complexity and mix of tools and methodology confirm the appropriateness of the research design for my study which will be presented in detail in Chapter Four.

Bernard (2012) argues for the appropriateness of the survey model used in a Kenyan study as suitable to measure the baseline conditions of less formal physical learning environments, such as those presented in the South African ECD context. Survey models with applications or adaptations of established environmental rating scales are often used in large-scale research projects. Researchers can thus focus on several variables to define overall quality. Erbay and Ömeroğlu (2009) focused on the effect of school type, the number of children per classroom, the number of floors, and outdoor play provision in Turkey. Studies such as this one effectively confirm the impact of the variables and can assist in broader approaches to ECD provision and policy frameworks. Abbas, Othman and Rahman's (2012) research investigated the relationship between the physical environment and play behaviour in pre-schools in Malaysia. Their research was motivated by the lack of recognition of the value of learning environment quality in enabling ECD. The ECD landscape in Malaysia is similar to the one in South Africa, where the importance of ECD is recognised as a critical factor in improving human capital; however, the focus seems to be on the non-physical aspects of ECD provision. This approach includes the limited allocation of funding for the development, construction, or improvement of preschool infrastructure. Abbas *et al.*'s (2012) research follows a quantitative approach to measure the indoor and outdoor learning environments' impact on the play activities of preschool children, taking cognisance of active learning (learning through play) as the primary means towards development for the age group.

Although there are studies focused on the developed world, the comprehensive review of literature by Barrett *et al.* (2019) that focuses on the impact of school infrastructure on

learning at the primary and secondary school levels is contained to studies from the US, UK, and Western Europe. Regardless, the authors define five universal dimensions that potentially impact learning, and these are presented below as questions (adapted from Barrett *et al.* [2019]).

- Do all children actually have access to a **place** at school?
- Do the school buildings provide a **safe and healthy** environment?
- Are the existing learning spaces **optimally designed** for learning?
- Does the design of the school foster current **pedagogy and community** engagement?
- How can the school infrastructure be designed to **evolve sustainably** over the long term?

Underlying each question are the key theoretical considerations of place versus space, affordance, ecological connection, and a responsive learning environment. These dimensions can therefore be applied to different contexts globally and to places of learning and development in the early years.

In a related scoping review by Adams and Savahl (2017), these authors refer to nature as a children's space and view children's use of the outdoor environment from a rights-based perspective. The research is rooted in general concern about the reduction of children's free engagement with nature due to urbanisation, technological development, and security concerns. The importance of play is emphasised as critical to holistic child development. The review is primarily focused on middle childhood and looks at neighbourhoods, streets, natural spaces, and school grounds as informal learning environments. A framework of how nature influences children is identified to include individual, physical, and social factors, and the categorisation mentioned is also relevant to the ECD outdoor learning environment, where a child's interactions and activities in the outdoors are first determined by their demographic, socio-economic status, place experiences, and attitude towards active play. Physical factors include the quality, safety, and design of the landscape and equipment, as well as the level of affordance provided. In the ECD setting, social factors include the pedagogic approach and level of control by adults, cultural conceptions of the outdoors, and the geographical perspectives of the setting.

The findings conclude the need to include children in the research process as active participants (Adams and Savahl, 2017). The exploration of the methodology to include children includes the use of photographs or drawings by the children. Following this approach, Azlina and Zulkiflee (2012) conducted a pilot project in an ECD setting where children's drawings were combined with other qualitative instruments similar to the mosaic approach (Clark, 2007). The finding emphasises the need for children to have free exploration and movement between the range of activity areas, which is often lacking in the Malaysian context and could be ascribed to adult views.

Honing in on the early years, the recent scoping review by Berti *et al.* (2019) of learning environment research concerns the relationship between ECD and the physical environment and the perceptions of a physical environment that has been established as the state of the art in the field. The review is rooted in the argument that the physical environment is a critical component of quality ECD, along with the staff and the pedagogic approaches used. These three components—social, psychological, and physical—create an interconnected system for the development of children. According to Berti *et al.* (2019), the evolution of LER focused on ECD originated from the investigation of specific physical environment parameters in the period from the 1970s to the 1990s. Since 2000, the research has included children's experiences, their emotional responses, and adult views. The first action research and participatory design process only took place after 2010, and this slow-moving expansion of what and who to evaluate indicates an increased scope of understanding and recognition of the complex integrated system that forms an ECD learning environment. The authors consider the change to represent the conceptual understanding of the environment from "a passive container for educational actions" to a "complex dynamic reality, in which perceptions and relations are fundamental" (Berti *et al*., 2019, p. 1010).

In my search of the evaluations of ECD environments, I identified some key authors. For instance, Sanoff (1995) developed both design guidelines and a rating scale for early childhood centres in the US. The premise of his work is to inform the development of learning environments that are conducive to children's learning and development, as the focus is on health and safety and meeting minimum statutory standards. These environments force teachers and children to adapt, and their behaviour becomes restricted by what their

environments offer. Acknowledging the integration of pedagogy with the various elements of child development in the learning environment, his target audience is preschool educators. Referring to child development theories and the Reggio Emilia approach to explorative learning, the environment is proposed to be inviting and stimulating.

The contribution to learning environment research for early childhood development includes a participatory process combined with evaluation tools (Sanoff, 1995; n.d.), and this is extended to post-occupancy evaluations (POE) of schools using a range of methods (Sanoff and Hashas, 2001). The research methods and tools developed can be traced further in the work by of Lippman (2010a) and more recently in the work of Matthews and Lippman (2016; 2020). Their research includes the design process of the post-occupancy evaluations, and the aim of the evaluations is to gather data from teachers and children that includes behavioural mapping, documentation of physical traces, and observation of spaces. The participation of children and listening to them, even at a very young age, has been greatly influenced by the mosaic method developed by Clark (2007) as a research method and a participatory design process (Clark, 2010a). The notion of listening to children is rooted in the Rights of the Child and supported by UNESCO. In the South African context, this listening and participation can be extended to the women who represent the ECD sector, as they are often marginalised and left to rely on the goodwill of others to support their centres.

The methodology of the post-occupancy evaluation has further delivered the children's physical environments rating scale (CPERS), an evaluation tool specifically designed for early education spaces and developed and reviewed by Moore and Sugiyama (2007). The focus of the CPERS is to measure the quality of the physical learning environments scientifically to facilitate quality early childhood development, and it was born out of the recognition that existing evaluations of quality barely considered the physical aspects of the space. The assessment tool provides a quantitative scale that combines architectural and educational concepts to evaluate the potential of the physical space to foster development and learning. The assumption of this scale is that environments are architecturally designed, and the scale is most suitable for application to formal learning settings. The evaluations produced using the CPERS are comprehensive, detailed, and have been tested for reliability, validity, and transferability (Moore and Sugiyama, 2007). Notably, the rating scale provides quantitative

data with a numerical rating for each of the four main categories, each with a number of sub-categories. The scientific focus of the evaluation tool contrasts with that of Sanoff's (1995) tool, even though both are rooted in the same theoretical lens of constructivism. The application of CPERS is valid in large-scale evaluations of the quality of early childhood development learning environments, and the scale could be used well to inform policy in the developed world. It is, however, not ideally suited for the range and, at times, informal nature of the learning environments for children in developing nations.

The review of learning environment research for children would not be complete without the inclusion of the contributions by Dudek (1996; 2005; 2008); and Day and Midbjer (2007). Their work is rooted in the domain of architecture and provides a strong basis for understanding the unique qualities required to design for children. Day and Midbjer's (2007) work is rooted in the phenomenological paradigm and considers the sense of place, dwelling, and responsiveness to geographic and climatic conditions. The relationship with nature is emphasised, as are the differences between adult and child experiences. Dudek (1996) developed his understanding of designing for children through extensive research of the history of kindergartens and schools, child development theories, and case studies of exemplary architecturally designed learning environments for children. His primary focus is a child-centred design approach that facilitates exploration. Critical to his work is the position of the child in society and how this has changed over time with new technologies, changes to society, and new pedagogic approaches (Dudek, 2005; 2008). There is similarity in the views of Dudek (2005); and Clark (2010b), in that they both focus on the agency of the child from a young age. The shortcoming of these architectural sources, rooted in the UK, is in their application to the diversity of early years' educational settings in developing countries. Notwithstanding the architectural principles of the child-centred designs, sense of place and responsiveness have the potential for translation into the context of South Africa (Cloete, 2016). and this is aligned with the key considerations identified by Barrett *et al.* (2019), as discussed above.

As a critical part of learning environment research, Bligh and Pearshouse (2011) support the value of learning space evaluations as a mechanism to improve the way in which spaces are used and how the spaces impact learning. Their work also recognises the potential for

evidence-based design. Although their research is focused on post-compulsory education and, as such, deals with youth and adult learning, it is rooted in the relationship between people and spaces in the context of learning. Of particular relevance is the consideration of learning theories as an unexplored component of learning environment research. The way in which learning or development in an early childhood development environment occurs has a direct relationship to the space occupied, and learning theories can form the foundation of learning space evaluations in order to provide a contextualised understanding of learning and space relationships.

The role of the environment-behaviour relationship in influencing the development of young children has thus been established in my review of the literature. Various bodies of research also highlight the limitation of not considering the physical aspects of the learning environment as a critical component of quality early childhood development. The research has shown how the limited acknowledgment of the physical space influences policies that focus on other parameters, such as pedagogy and educators. This concern has been found to be more pronounced within the domain of early childhood development learning environments.

2.3. SEEKING QUALITY FOR EARLY LEARNING ENVIRONMENTS

In response to objective 3: To establish the relationship between the quality of early childhood development (ECD) and the quality of the ECD learning environments, this section furthers the exploration of the relationship between the environment and young children based on literature from learning environment research as well as architectural and other design guidelines. The section is presented thematically, working from the broad characteristics of quality towards a more refined conceptualisation of responsive learning environments, with the final theme exploring the architectural methodology of a pattern language for early childhood development learning environments. Fig. 2-2 illustrates the structure of the section.

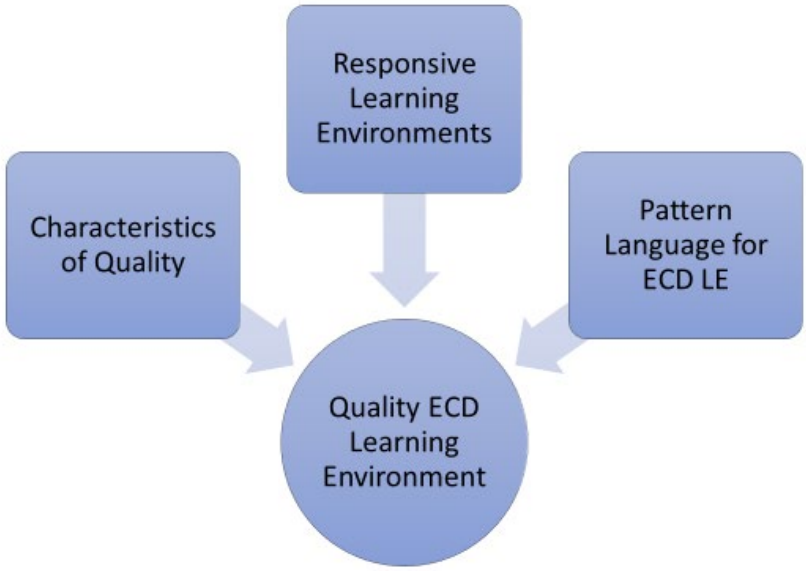

Figure 2-2 Thematic Exploration of Quality Early Childhood Development Learning Environments

Source: Author (2023)

2.3.1 CHARACTERISTICS OF QUALITY

High-quality early childhood development can benefit all children, but even more so those from disadvantaged contexts. Unfortunately, according to Aguiar and Aguiar (2020), these children are enrolled in low-quality classrooms. A classroom's quality consists of its structural features, which include the class size, the children-to-teacher ratio, the educational level of the teacher, and process quality, which refers to the daily experiences of the children and their interactions. In the discourse on the quality of early childhood development and early learning, key considerations include teachers' education and continued career development; adult-to-child ratios; the involvement of parents; and the availability and use of developmentally appropriate materials. In terms of the physical environment, there is some consideration of the playroom layout and organisation and the display of materials; however, the discourse aimed at informing policy is still limited as it lacks in-depth consideration of the built and natural settings (Matthews and Lippman, 2020).

Arndt (2012) elaborates on the role of the holistic learning environment in impacting children's cognitive development and advocates for considering biological and neurobiological processes in the design of learning spaces to create **quality** learning environments that promote cognitive development. Arndt (2012) also warns that the malleability of a child's brain should

not be seen as an excuse to disregard the importance of their learning environment. For a child to use her cognitive and emotional resources optimally, a supportive environment is needed where learning processes can flourish.

Different stages of development require unique environments. The early years are defined by their need for adult care, which translates into an affinity for secure spatial environments. Young children have a natural affinity for nature, and their built environments should therefore be close to natural environments or have a solid relationship with the outdoors. A further consideration is the changes in the children's social groupings, from being in small mixed-gender groups in preschool with strong relationships with the adult carer/teacher to larger groups and less dependence on the carer as the child matures.

The learning process in an educational setting provides a framework for the types of spaces and room layouts. In preschool settings, the approach of learning by doing is predominant, emphasising the need for environments that **inspire and enable exploration**. Neurobiological research indicates that a learning environment that does not support the learning process of a child causes cognitive strain. The development of the frontal cortex is dependent on a stimulating environment and continuous opportunities for self-determination, i.e., action and discovery (Arndt, 2012). Preschool children, therefore, require a **secure environment** that enables **freedom** to implement their learning. The proposed integration of learning processes and spatial design considers the requirements of learning by doing and observational learning. Some of these integrated learning spaces come across as practical measures of space for children, with room for movement to allow individual attention, storage, and access to materials (Sanoff, 1995). The clarity of the space is emphasised to reduce distraction and provide stability. Group gathering spaces, moveable furniture, and requirements for light and acoustics are also considered, as sound can impact cognitive processes and cause emotional disturbances (Arndt, 2012).

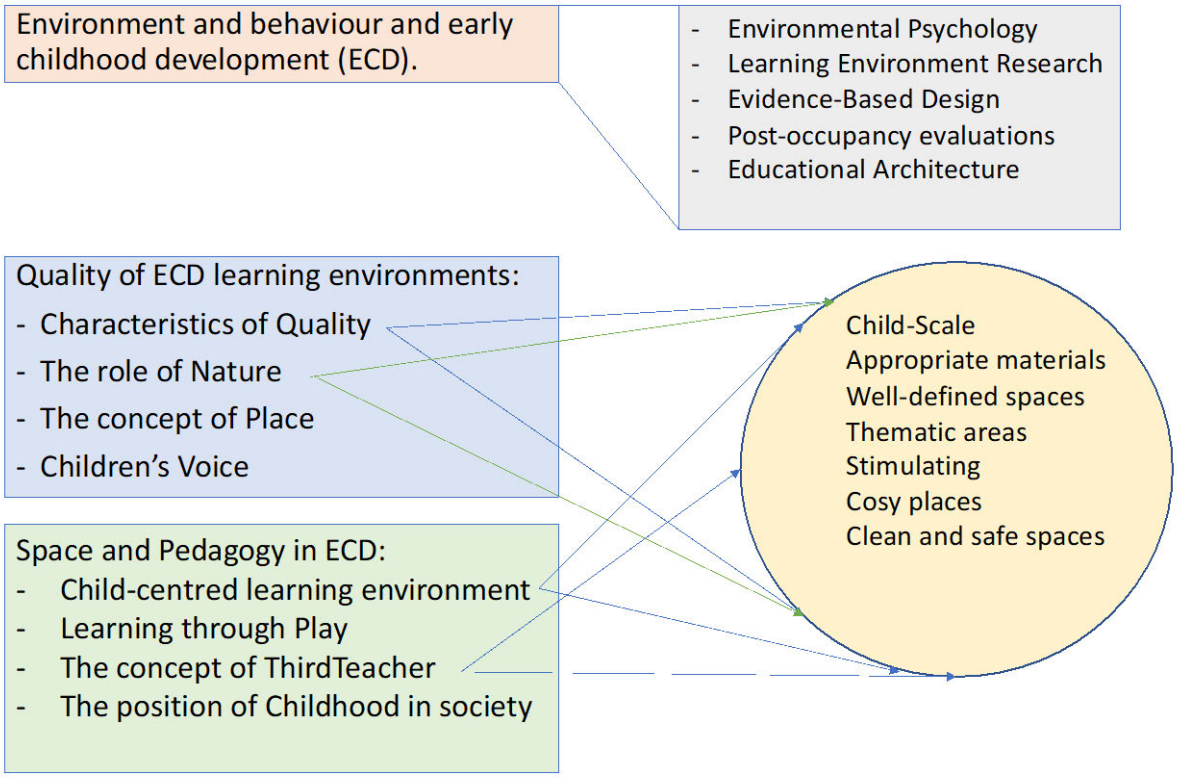

Figure 2-3 Literature Map

Source: Author (2022

Specific **characteristics** of the (physical) learning environment are identified as reoccurring in various research outcomes (Berti *et al*., 2019). These characteristics can be applied to both indoor and outdoor learning environments: A c**hild-scale** design; a range of **appropriate materials**; **well-defined spaces**; **cosy places**; an overall requirement for **clean** and **safe** spaces; and **connectedness to nature**. The differences in child and adult expectations and perceptions of their learning environment are also noted and echoed by related research by Gaminiesfahani *et al.* (2020) in their investigation of healing environments for children. However, Matthews and Lippman (2020) extend the environment to include the setting of the school, the playrooms, and outdoor spaces as an integrated system of place, social interaction, and holistic development. This approach lends an understanding of quality through the ecological systems lens and considers the concept of the third space, as discussed in Section 2.2.

Table 2-1 Review of the Characteristics / Parameters of Quality

	Literature Sources		
Characteristic/ Parameter Identified in the Literature Reviewed	Matthews and Lippman (2020)	Berti *et al*. (2019)	Moore and Sugiyama (2007)
Child-scale design	✓	✓	✓
Developmentally appropriate material	✓	✓	✓
Environmental complexity	✓		
Well-defined spaces		✓	✓
Spatial arrangement of the setting	✓		✓
Legibility of the classroom cues	✓		
Cosy places		✓	
Shelter from stimulus	✓		
Clean and safe	✓	✓	✓
Natural light	✓		✓
Ventilation	✓		✓
Connection to nature		✓	✓
Noise levels (sound)	✓		✓
Space density (crowding)	✓		✓
Flexibility	✓		
Age-appropriate spaces and material			✓

Source: Author (2023)

Table 2.1 lists the range of characteristics from recent reviews and the CEPRS that all focus on the quality of learning environments. The tabulated review reveals just how complex the requirements for the quality of the learning environment are. The slight difference in focus and findings between Berti *et al.* (2019); and Matthews and Lippman (2020) could be ascribed to the positioning of the authors in the different disciplinary spheres of educational psychology/social studies compared to architecture with an educational focus. My inclusion of the CEPRS is not comprehensive, as it is based on Moore and Sugiyama's (2007) review and evaluation and not on a detailed analysis of the rating scale. The evaluation presented in Table 2-1 is therefore not comprehensive. However, this initial review does indicate some gaps in the CEPRS as it is based on preceding rating scales for quality in the early years learning environment research that excluded the focus on physical parameters.

In parallel, Berris and Miller (2011) identify the following three dimensions of the physical design required for quality early childhood development:

- Space that enables exploration, independence, and development.
- Spatial quality (space, light, noise, and materials).
- Integration of the outdoor and indoor spaces.

Other relevant aspects not specifically highlighted are a sense of place, appropriate scale, and connection to the community. However, these aspects are discussed as underlying the above three categories. The dimensions here resonate with the characteristics listed in Table 2-1, with the three main dimensions providing similarities to the holistic evaluation of the clever classrooms approach (Barrett *et al.*, 2017).

With the differences in the characteristics of quality learning environments as a background, a deeper of understanding of certain qualities needs to be established. Research indicates that **health and safety** are seen as non-negotiable requirements essential for both children and adults (Berti *et al.*, 2019). In South Africa, the health and safety of the physical learning environment are established as minimum requirements required for registration as an early childhood development provider (Department of Social Development, 2006). Concerns about safety, the provision of water for drinking and cleaning, and the provision of adequate ablutions are particular concerns in developing countries (Bernard, 2012). The requirements

for safety and hygiene do not feature in many studies from developed countries such as the US and UK, for example, the study by Matthews and Lippman (2020) notably makes no reference to these aspects. The CPERS surveys only refer to security and whether or not mirrors are provided in the ablution areas (Moore and Sugiyama, 2007). Berti *et al.* (2019) include health and safety when stating that learner education environments must not be chaotic and must avoid risk. Cleanliness is included in their findings without a clear definition of what this means in relation to the early childhood development environment. These contextual differences in understanding of what health and safety represent allude to the stark reality of the difference in the quality of learning environments in various parts of the world.

Related to safety are the spatial requirements per child, which in most countries are stipulated to meet a minimum requirement. Low **spatial density** is preferred, as higher density may lead to crowding that impacts behaviour and can affect children's cognitive and emotional development (Matthews and Lippman, 2020). The negative aspects of limited space and high learner numbers seem to encourage distraction, physical activity, and an increase in socio-emotional issues (Moore and Sugiyama, 2007). Some sensibility regarding the regulatory ratios is thus required, and a designer should work with the teaching staff to establish how spaces will be used rather than blindly applying the stipulated ratio (Dudek, 1996; 2008; Berti *et al*., 2019; Erickson, 2019).

Noise levels are directly related to the number of children and the spatial density in the classroom; however, the spatial design can influence the way in which the sound is experienced. The environmental aspects influencing **sound** are the construction materials used, finishes and furnishings, the spatial configuration of the room and the school's layout, and the way in which the teacher directs the activity in the class. Matthews and Lippman (2020) also elaborate on the negative influence of sound from the surrounding area from transportation or construction sites. The detailed design and layout of areas for activities that include noise are considered in the CPERS, as it considers the acoustical treatment for music areas and accommodates for quiet play (Moore and Sugiyama, 2007). The Holistic Evidence and Design (HEAD) research design also indicates the relevance of sound in the Stimulation, Individualisation and Naturalness (SIN) evaluation model as part of the 'naturalness category', and it is a secondary factor in the model (Barrett *et al.*, 2015). However, Barrett *et al.*'s (2015)

research was conducted in primary schools, where one can assume that a level of control over children is achieved. This differs from preschool and crèche environments with younger children and babies and toddlers respectively, who cry when unsettled and shout when excited. Matthews and Lippman (2016) argue that noise can contribute to environmental chaos that may lead to stress for both children and teachers. They further propose activity zoning and the inclusion of breakout spaces as an architectural mechanism providing appropriate environmental complexity that supports different learning needs and accommodates small group activities.

Research across the spheres of education, developmental psychology, and architecture agrees on the requirement of a structured spatial arrangement to accommodate a range of learning activities. Berti *et al.* (2019) confirm that a **well-defined** environment with **thematic** areas that include a range of materials enables exploration, engaged play, and positive interactions with other children. Sanoff (1995) uses the term 'learning centre', and stipulates that each thematic area in an early childhood development learning environment must stimulate the senses, stimulate activities, and stimulate cognitive processes. The availability of specific academic materials like books (in a reading corner) and writing materials is shown to increase cognitive development and help with children's school readiness.

Matthews and Lippman (2020) further the notion of a defined teaching structure when discussing the **legibility** of the learning environment in terms of the cues provided for certain activities. Arndt (2012) relates these cues to the learning process of learning by doing rather than observational learning. An active learning process requires an enabling environment where the materials and equipment support the natural process of discovery. Legibility in the environment also provides familiarity and knowledge, which alleviates stress (Arndt, 2012; Matthews and Lippman, 2020). According to Barrett *et al.* (2015), **environmental complexity** refers to the way in which the environment provides an appropriate level of stimulation. Both the architectural and the interior design can support complexity through form, material, colour, and the positioning, size, and shape of windows (Dudek, 1996). Barrett *et al.* (2017) exclude **colour** from complexity, while in contrast, Matthews and Lippman (2020) include the use of colour as a component of the complexity and legibility of the learning space.

A well-defined environment is often inherent in the **spatial arrangement of a setting,** and it provides appropriate relationships between different learning spaces and allows for easy movement or circulation throughout the environment and between the indoor and outdoor spaces. Moore and Sugiyama (2007) attest that a good layout of the learning spaces eases navigation within the school setting. One of the evaluation criteria specifically considers the point of arrival and whether it is welcoming for parents and children. The relationship between different spaces in the school can also encourage movement and provide a sense of enclosure. The positioning of ablution facilities must allow easy access from both the indoor and outdoor learning environments, and easy access to them reportedly encourages children to use the space/facilities. This applies to all the facilities in the school environment (Berti *et al.*, 2019). The spatial arrangement of the setting can also support the pedagogic approach of active learning and greater connection with nature. Architectural case studies of different spatial arrangements and how these are applied support the pedagogic approach or the ethos of particular schools (Sanoff, 1995; Dudek, 1996).

However, connected to structure and spatial arrangements is the need for some **flexibility** to enable educators and children to shape their own environment to some degree (Matthews and Lippman, 2020). Such flexibility includes movable, lightweight walls, moveable storage units, and even child-sized furniture. This allows for the environment to be shaped as part of the learning activities and could be seen as providing opportunities for place-making (Unwin, 2019). Being given the flexibility to change aspects of an environment provides a sense of ownership, which Barrett *et al.* (2015) refer to as individualisation. An architectural design that includes a more complex platform with breakout spaces and outdoor rooms provides flexibility in how the learning environments are used and accommodates different qualities (Matthews and Lippman, 2016).

The criterion of **developmentally appropriate material** primarily refers to the curriculum and specific teaching materials provided for children to interact with, not necessarily the environment (Matthews and Lippman, 2016). However, based on the concept of the third teacher, the physical environment provides silent lessons in the same way as pedagogic material (Robson and Mastrangelo, 2018). The outdoor learning environment includes multiple forms of natural materials that support child development, just as the pedagogic

material does (Wirth and Rosenow, 2012). The task of architecture and teachers is to curate the environment in a manner that is age appropriate. Here, one would consider the ability of the children at their developmental stage, as well as their physical ability and scale (Sanoff, 1995; Moore and Sugiyama, 2007). The related criteria of **age appropriate spaces** and materials suggest that the spatial design for different age groups requires further consideration (Moore and Sugiyama, 2007). Day and Midbjer (2007) describe childhood as a journey of developing consciousness that requires careful consideration of the fact that a child requires different kinds of environments from the infant stage through the toddler stage to the preschooler stage. The critical determinants relate to the balance of their conflicting needs of reassurance (dependence) and exploration (independence). In the early childhood development learning environment, each age group requires its own space, where the younger groups have a homelier milieu with a greater sense of security, while older children become more active and develop a sense of adventure through exploration. The way that children experience and use space is often different from what adults may expect; therefore, engaging children as part of curating their environments is appropriate (Ferreira, Karila, Muniz, Faria and Kupiainen, 2018). For younger groups, observational studies can ensure that their unique needs are met (Bert *et al.*, 2019).

A critical component of environments for children relates to scale, which refers to the physical size of spaces, furniture, and equipment and how these relate to the size of the children. Child-scale includes the provision of child-sized furniture that is lightweight so that children can move it around as part of their place-making activities (Unwin, 2019). However, **child-size** also considers the scale of the space and whether it provides the required sense of security (Moore and Sugiyama, 2007). This could be achieved through alcoves or lower ceilings in the learning spaces, as well as natural features that provide protection (Berti *et al*., 2019). Low windows or low-hanging lights can similarly provide a sense of enclosure (Dudek, 1996; Moore and Sugiyama, 2007). The need for **cosy places**, where a child can be alone or play quietly with a friend, is critical for emotional development (Day and Midbjer, 2007). These spaces can also provide **shelter from stimulus** (Matthews and Lippman, 2016), specifically for sensory sensitive children such as those on the autism spectrum (Martin, 2016).

Matthews and Lippman (2020) argue that **natural light and ventilation** are often neglected in the design and evaluation of learning spaces. However, Barrett *et al.* (2017) report that the quality of the light and air has a significant impact on the overall progress of primary school pupils. These factors impact children's attention and general well-being, as low lighting levels and poor air quality can cause children to feel less energetic, while light that is too bright can have the opposite effect. From a suitability perspective, natural daylight and natural ventilation are not only good for children but also provide responsive building solutions (Day and Midbjer, 2007), as they avoid the use of electrical lighting and mechanical ventilation systems.

An **outdoor learning environment** in an early childhood development space is defined as crucial to holistic child development (Deaver and Wright, 2018; Berti *et al.*, 2019). The outdoors, and specifically the natural environment, is reported to enable complex play and increased exploration, as well as the development of motor skills and the combating of issues with lack of attention, hyperactivity, and autism (Harte, 2013). A good balance of constructed play equipment and green spaces in a well-defined outdoor learning environment is recognised as optimal. The pedagogic approach in these environments needs to enable child-directed free play towards "enhancing choice-making, problem-solving, self-regulation, and prosocial behaviour" (Berti *et al.*, 2019, p. 1011). The presence of nature enables an awareness of the relationship between people and nature (Day and Midbjer, 2007).

The approach toward manufactured play equipment can provide a balance between safety and exploration, and one of the critical purposes of play equipment is to encourage physical activity. Laris (2005), a designer and manufacturer of play equipment, follows the research methodology of observation to understand how children see and use play equipment. His research-led approach to design acknowledges the different perceptions and experiences of adults and children. He defines standard play equipment as adults' visions for children's play that lack the diversity required for the imaginary play that children often need (Laris, 2005). This argument for balance between natural and man-made equipment is confirmed through children's perceptions of their outdoor environments (Berti *et al.*, 2019).

Dennis *et al.* (2018) established the key elements of the most effective environments based on a post-occupancy evaluation of nature-based early childhood development. These key elements are:

- A variety of choices (what, where, and with whom to play).
- A range of small child-scaled spaces (hide-outs, cosy spaces, and crawling spaces).
- Routes that are mapped out by pathways and edges to encourage exploration and movement.
- Flexibility in the spaces to accommodate various developmental stages.
- A co-design approach to enable the evolution of the space as a joint venture between adults and children.

Notably, these elements align with those found in quality internal environments, emphasising the outdoors as an extension of the interior environments. Their study also confirms the crucial role of the environment in quality child development, specifically in the early years (Dennis *et al.,* 2018). The educational architect Erickson (2019) concurs about the equal importance of indoor and outdoor learning environments in his reflection on his years of designing learning environments. He further emphasises the role of natural landscapes and vegetation to balance hard landscapes and play equipment. The restorative qualities of natural outdoor spaces are specifically beneficial for children with attention deficit disorder (Wilson, 2015).

Natural outdoor settings without the manicured or stylised hand of human intervention afford child development that is different from the usual outdoor play areas found in early childhood development centres. A research project by Ernst (2014) found that the access to and safety of natural (wildlife) settings in the USA impacts how often children visit such settings as part of their learning activities. However, the limitations of poor access and safety concerns have also been reported to be preconceptions rather than real barriers (Ernst and Tornabene, 2012). Kernan and Devine (2010) highlight the relatively recent institutionalisation of early childhood and the negative impact on children's engagement with nature. In a related study, children's play with mud and water is investigated, with the assumption that all children will present a natural affinity for this type of play. However, Fruin (2020) finds that the influence

of parents and/or carers has an impact on whether children want to engage in the play. These results indicate the multi-layered setting of nature and its role in early childhood development.

The role of adult views and approaches to outdoor engagement is highlighted in the literature (Kernan and Devine, 2010; Harte, 2013; Deaver and Wright, 2018), specifically when working towards whole-child development. Research indicates that both parents and teachers value the role of the outdoor play area. However, educators are not fully aware of its potential as a learning environment and tend to limit their role to supervision during free play rather than engaging actively in the activities (Berti *et al.*, 2019). Physical development is the most apparent priority during outdoor play, as children can move more freely and use play and play equipment for a physical challenge. Engagement with natural items such as pebbles, bark, leaves, and flowers enhances the development of fine motor skills. However, caregivers', teachers', and peer engagement can extend cognitive development in a natural setting. Social and emotional development similarly occurs during social and child-constructed thematic play (role-play). The potential for cultural expression is also explored more naturally through thematic play in a natural setting than through play in the relative confines of the classroom (Szczepanski, 2013).

The most recent publication investigating the quality of early childhood learning by Bendini and Devercelli (2022) shows that the focus on learning environments is embedded as critical for quality learning. The publication commissioned by the World Bank specifically targets policymakers and supports the work of Adlerstein and Cortazar (2022) that defines five key principles for quality early childhood development learning environments and provides strategies for the implementation of quality standards. The principles include overall safety, pedagogical organisation, spatial flexibility, empowerment, authorship, and child-centred design, and these echo the characteristics of a quality learning environment already discussed in the preceding section.

Table 2-2 Alignment of Characteristics with Key Principles

Characteristics/Parameters from the Literature Review (from Table 2-1)	**Key Principles Identified by Adlerstein and Cortazar (2022)**

Child-scaled spaces	Child-centred design
Developmentally appropriate material	Pedagogic organisation
Environmental complexity	Child-centred design and pedagogic organisation
Well-defined spaces	Child-centred design and pedagogic organisation
Spatial arrangement of setting	Pedagogic organisation
Legibility of the classroom cues	Child-centred design and pedagogic organisation
Cosy places	Child-centred design
Shelter from stimulus	Empowerment and authorship
Clean and safe	Overall safety
Natural light	Overall safety
Ventilation	Overall safety
Connection to nature	Spatial flexibility
Noise levels (sound)	Overall safety
Space density (crowding)	Overall safety
Flexibility	Spatial flexibility
Age-appropriate spaces and material	Child-centred Design

Source: Adapted from Adlerstein and Cortazar (2022)

Table 2-2 illustrates how the principles provided by Adlerstein and Cortazar (2022) consider all the characteristics of a quality learning space that architectural researchers have also identified. Their research is of great value as it provides a real-world global perspective that includes multiple references for how the quality characteristics of each principle were achieved in non-ideal environments through creative collaboration with teachers, often in under-resourced settings. The alignment can be extended to the broad criteria established by Barrett *et al.* (2019) for schools (see Section 2.2.3). The relevant principles for early childhood

development learning environments can form appropriate responses for each of the following questions:

- Do all children actually have access to a **place** at school?
  - *child-centredness and empowerment*
- Do the school buildings provide a **safe and healthy** environment?
  - *overall safety*
- Are the existing learning spaces **optimally designed** for learning?
  - *pedagogical organisation and child-centredness*
- Does the design of the school foster current **pedagogy and community** engagement?
  - *pedagogical organisation with empowerment and authorship*
- How can the school infrastructure be designed to **evolve sustainably** over the long term?
  - *spatial flexibility*

The inclusion of sustainability could be emphasised as well, to further the consideration of what an optimal learning environment might mean and how children access place. Community inclusion is explored as an approach to responsiveness in the next section.

2.3.2 RESPONSIVE ECD LEARNING ENVIRONMENTS

A responsive design approach develops an in-depth understanding of the end user's needs, considers what will occur in places, and considers the uniqueness of each site and the context in a design process that includes a research phase (Lippman, 2010b). My own definition of responsiveness in architecture echoes the same concern for the needs of people (children, educators, and parents) and their context—geographically, socially, and culturally (Cloete, 2016). In early childhood education, responsiveness starts with the notion of child-centred education (Burman, 2007; Močinić and Feresin, 2017).

Dudek (2005), an architect and researcher of educational architecture, describes the book *Children's Spaces* as providing adults' voices regarding their child-centred views. Adults working towards child-centredness require sympathy for **children** and a deep understanding

of how their learning environment shapes their lives. Part of this process is the need to observe children and to obtain their voices as active participants in the research and design of their spaces (Clark, 2010b). A child-centred approach positions the child as central to the environmental design as a means to communicate the philosophies of childhood, their development, and the role of the environment in their development.

A **child-centred** learning environment is rooted in acknowledging the inherent and often subtle differences between children and adults (Day and Midbjer, 2007). The inclusion of children's and adults' perceptions in research and later in design has led to the conception of user-defined approaches to design (Lippman, 2010b; Rigolon, 2011; Berti *et al.*, 2019). When children are included in the design process, they can identify strengths and weaknesses in the design and often provide creative solutions to the issues. An added benefit of giving a voice to children is the opportunity for them to achieve self-determination and autonomy. The interaction between educators and children in this regard allows for a relationship with improved communication and understanding of each other's views and needs. Supporting this approach, Berti *et al.* (2019) comment on the development of the conceptual approach and focus on the meaning of space that enables an interconnected understanding of the physical and psychological environment. A conceptual change allows for the definition of the learning environment as a 'third teacher' (educator). Berti *et al*. (2019) confirm the notion of the physical environment as a third teacher, stating that the Reggio Emilia approach provides an approach to early childhood development where the environment becomes part of the pedagogic approach.

Including the display of children's work is an essential aspect of this approach to connecting children to the physical space and providing a **sense of belonging** (Eckhoff, 2019). The practice of display is ingrained in the Reggio Emilia approach and is generally practiced in early childhood development settings. The display presents physical traces of learning and represents a component of the notion of the environment as the third teacher, but Eckhoff (2019) criticises the tendency of a teacher to dominate the selection and manner of display of the work. For the learning environment to be recognised as the third teacher, the early childhood development sector's stakeholders—educators, parents, and policymakers—need to have greater environmental awareness. Berti *et al.* (2019) propose reflective practice for

educators so that they can become more aware of their perceptions and views and how these influence their practice. The core issue is that the role of the physical environment is often determined by the personal and pedagogic opinions of the staff. Here, optimal use of the outdoor environment is often not achieved due to a controlling approach in terms of safety or limited daily routines due to the pedagogic emphasis on school readiness rather than active learning.

The repetitive theme of exploration, child-centredness, and learning through play emphasises the relationship between the learning approach and the learning environment. Various pedagogic approaches rooted in constructivism were developed from the theories of Piaget and Vygotsky, and they have a social slant that is central to active learning (Richardson, 2003; Langford, 2005). In **early childhood development pedagogy, constructivist** approaches are particularly suited to how 'learning' can occur in multiple manners through children's active roles in constructing their knowledge (Močinić and Feresin, 2017). The most known pedagogies are the Montessori method (originated in 1907 in Italy), the Regio Emilia system (originated in Italy post-World War II but officially in 1976), and the high/scope approach (originated in 1963 in the USA). These educational approaches have been borrowed and integrated into many early learning programmes and educational policies.

The high/scope approach, similar to the Reggio Emily approach, includes the learning environment directly in children's active construction of knowledge. The high/scope approach is based on five principles that work together and have active learning at the core: adult/child interaction; learning environment; daily routine; daily assessment; and active learning (Durak, 2009). The learning environment layout and special interest areas in the high/scope spaces are developed using a form of co-design within each class, and the views and preferences of each child are considered and applied. This pedagogy requires an architectural design that allows for layout flexibility and provides display areas for children's work. Durak (2009), like Sanoff (1995), argues for the architects of early childhood development learning environments to be knowledgeable about child development and education, further underlining the need for consultation with **educators** and **parents** and participatory processes to form part of the design process.

The mediation of architects' and educators' views is critical for achieving quality learning environments (Rigolon and Alloway, 2011; Berti *et al.*, 2019). Research indicates that co-designed early childhood development learning environments achieve high environmental ratings and the overall well-being of the inhabitants. Similarly, the inclusion of families and the community is noted to enhance the quality of the environment and learning. The potential for early childhood development centres to provide community services is recognised as good practice in research as well as in international policy frameworks.

Considering forms of engagement, Berris and Miller (2011) have identified the potential of combining the CPERS rating scale (Moore and Sugiyama, 2007) with a qualitative investigation of the perceptions of teachers and parents. However, having an architect as the primary researcher of early childhood development learning environments seems limiting, as the focus tends towards co-design rather than investigation. Durak (2009) conducted a case study of a high/scope early childhood development centre in Turkey, that included child participatory workshops. The value of participatory processes is confirmed through research such as Berris and Miller's (2011) evaluation of two early childhood development centres in a low socio-economic context in Australia, which includes both interviews with teachers and parents and a quantitative evaluation of the physical space. The study acknowledges the learning environment as the third teacher and a critical partner in the holistic development of children. These forms of research and co-design enable the development of responsiveness while also creating awareness of the value of the physical environment. The theoretical approach and exploration of space in early childhood development settings by Ferguson and Kuby (2015) show that these learning environments are understood as social constructions of the third space (Soja, 1996). This theoretical framing of space unpacks the interwoven spatiality of the early childhood development learning environment's physical, pedagogic, and social constructs. The concept of the third teacher could thus be understood as an expression of the third space that provides more depth to **social** responsiveness.

The third teacher is a socio-material concept that acknowledges the focus of a community participation praxis in the design and construction of early childhood development learning environments (Hall, 2017). However, the potential relationship between architecture, pedagogy, and policy inherent in the approach and that originated in the Reggio Emilia system

has not been explored much and applied in research (Cloete, 2016; Močinić and Feresin, 2017). Research around the third teacher tends to focus on its relationship with pedagogy, and there has been minimal focus on community participation and the inherent outcome of responding to the user needs and context of a given setting (Hall, 2017).

Architectural responsiveness to the **geographical** context requires a multi-layered approach that includes a micro, meso, and macro scale understanding of the urban and rural surroundings. The urban context forms relationships between the formal learning environment of the early childhood development centre and the informal learning environment of the neighbourhood or city block. Here, connections to public transport, parks, and other public gathering spaces, such as libraries, markets, and cafés, support the development of children and can provide connectedness to the community (Hertzberger, 2008). In this sense, the topography and climatic conditions of the setting inform the building form and how passive design can be implemented in terms of the light, temperature, and ventilation of the physical environment (Dierkx, 2002; Day and Midbjer, 2007). The topography of a site further informs the positioning, building form, and structural system needed to provide a suitable outdoor play area. This approach is rooted in an environmentally sustainable approach to architectural design and extends to the selection of construction methods and materials that are aligned with local practices (Dierkx, 2003).

Culturally responsive approaches to early childhood development include native language embedded in the pedagogy and cultural expression in the materials and physical environment (Flores and Riojas-Cortez, 2009). Culture is often overlooked, especially when the native language and culture differ from the teaching language and culture. The relationship between poverty and poor quality early childhood development centres is often associated with a lack of cultural responsiveness in lower socio-economic areas, revealing the direct relationship between the learning environment and the quality and nature of children's play (Flores and Riojas-Cortez, 2009). There is, however, potential to strengthen cultural practices through architectural approaches that follow environmentally responsive approaches by including local materials and indigenous knowledge of building practices. Dierkx (2002) has developed models for inclusive schools in Nairobi, Kenya, that include a research-driven approach that highlights the potential of primary school learning environments in the African context and

addresses the various elements of responsiveness discussed previously. One of the key mechanisms of progress from research to the development of models is the use of pattern language.

2.3.3 PATTERN LANGUAGE AND RESPONSIVE LEARNING ENVIRONMENTS

Various design guidelines have been developed in parallel with those in the literature from environmental psychology and learning environment research to establish a benchmark for quality. These guidelines or sourcebooks take different forms, depending on the authors, publishers, and target audience. In the developed world, detailed design guidelines for schools and early childhood learning environments are established by government departments (Chartered Association of Building Engineers [CABE], 2008; Government of South Australia, Department of Education and Children's Services, 2012). These documents tend to provide guidance for a range of stakeholders, which may include educators, school principals, architects, and government department officials. Educational architects and researchers have also developed architectural design guidelines (Nair and Fielding, 2005; Dudek, 2008; Lippman, 2010b). The guidelines and books targeting educators aim to raise awareness of the value of learning environments (Sanoff, 1995; Izadpanah and Günçe, 2014; Zane, 2015). Unfortunately, there are not many resources that respond to the unique context and needs of the developing world, specifically for Africa.

In my review of the design guideline literature, pattern language has emerged as a recurring tool or methodology. *The Pattern Language* (Alexander *et al.*, 1977) is a seminal architectural sourcebook that provides potential design responses to reoccurring patterns in the built environment. The design patterns are thus rooted in architectural problems and provide a design tool with a research base. Critical to pattern language is its systems approach to recognising the interrelatedness of different patterns across a range of scales, from the macro setting of a city or region to the micro setting of a seating space. The interconnectedness of the patterns is what enables the formation of a language. The approach is rooted in an understanding of the relationship between people and their environment, and has a tendency towards favouring solutions that are based on people's needs (Seamon and Mugerauer, 1985). Pattern language is successfully applied in the development of responsive learning environments. It is widely accepted and influences the development of a more human-centric

approach today. It recognises that designs must be owned by everyday people as they shape their own environments. However, Dawes and Ostwald (2017) report that pattern language is also widely criticised. I found information on the application of pattern language to achieve quality learning environments in primary and secondary schools in the works of Lippman (2010b); Nair and Fielding (2005); and Dierkx (2002). Zane (2015) also discusses the application of pattern language to achieve the same in early learning environments.

Lippman (2010b) presents a framework for the responsive design of small learning communities in primary and secondary schools through the development of a pattern language. His approach borrows from Alexander *et al.'* (1977) notion of a pattern language as a system that guides the designer. However, Lippman (2010b) critiques the universality inherent to the original pattern language, noting Alexander *et al.'s* (1977) departure from the original pattern language with their evidence-based participatory process with learners in learning environments. Critical to this differentiation is that these authors' responsive patterns are imbedded in time and place, which Lippman (2010b) argues enables a framework that cannot be applied in other settings. In contrast, Lippman (2010b) states that the Alexandrian patterns enable the universal theoretical position of collective consciousness not through a research basis.

Notably, the design patterns for 21st century school design by Nair and Fielding (2005) aim to extend the Alexandrian method by providing a pattern language for learning environments based on the collective experience of the authors as educational architects and best practices established through case studies from across the world. Inherent to their approach is their appreciation of the interconnectedness of Alexander *et al.'s* (1977) patterns across scales and how they are rooted in an understanding of the relationship between people and their environment. A critical concern raised by Nair and Fielding (2005) is the disjunction between the ways in which schools are designed compared to how pedagogic approaches, learning, and developmental theory have evolved. Inherent to this concern is their limited understanding of the learning environment as the third teacher. These sentiments are shared by Barrett *et al.* (2019) in their research in the UK and by Bradbeer *et al.* (2017) in Australia. The concern for innovation using responsive patterns in the design of schools is also echoed by Lippman (2010b).

Dierkx's (2002) research and development of responsive school models for Nairobi, Kenya, included *The Pattern Language* as an analytical tool. This application combines the African tradition of storytelling with the development of patterns that incorporate human behaviour and movement with the conditions of the sites in terms of education, health and safety, human comfort, and environmental data (Dierkx, 2002). This author thus recognises and uses the essence of the Alexandrian pattern language in the description of a problem and how design can respond to it. The value of this approach is the manner in which the pattern language has been contextualised to respond to the cultural and socio-economic conditions of the developing nation situated in Africa. The models presented by this research are rooted in the country's and schools' cultures and read as responsive because of their narrative patterns without suggesting a universal response. Similar to Lippman (2010b), Dierkx's (2002) pattern development includes a participatory process that enables an embodied response to learning environment research and design.

In contrast to the former three approaches, which are all rooted in architecture, Zane (2015) is an educator who was introduced to *The Pattern Language* (Alexander *et al.*, 1977) through informal engagement with architecture. Notably, this attempt to develop a pattern language for early learning environments stems from a general disregard for the role of the physical environment. The aim, as a design guide, is to equip educators to transform their learning spaces to respond to the developmental needs of children and to support the pedagogy echoing the concept of the environment as the third teacher. Zane (2015) argues that a school is an interconnected system that brings together the physical (built and natural) and the people in the school. He does not explicitly echo the ecological systems theory and the socio-physical construct of the third space. The design patterns for early childhood classrooms are developed from a selection of the original pattern language. Each pattern includes a description of the original concept, followed by a description of its application and photographs of learning spaces to illustrate the application.

Each of these authors shows an application of pattern language that lends itself towards an understanding and development of responsive learning environments. The differences in approach range from criticism (Lippman, 2010b) to the borrowing and extension of the methodology (Dierkx, 2002; Nair and Fielding, 2005), to the direct translation of the pattern

to the context of the learning environment for early childhood development (Zane, 2015). Lackney (2007) develops design principles that include a similar approach of identifying a problem in order to develop a universal design response for community schools.

In my research, the application of pattern language is primarily theoretical (discussed in Chapter Three) and extended as an analytical framework and potential principles for the development of responsive early childhood development learning environments in the context of South Africa.

2.4. ECD POLICY AND LEARNING ENVIRONMENTS

In the background for this research (Chapter One), I unpacked the role of early childhood development in transforming the lives of children and the long-term benefits for a society that invests in early childhood development. I emphasised my search for what constitutes quality to improve the conditions of learning and educational outcomes throughout my review of the learning environment research. This section of the literature review will trace the relationship between children and policy from a global perspective and demonstrate how this unfolds in the context of South Africa in terms of early childhood development. The final part will shed light on how the role of learning environments is informed by policy.

This section therefore responds in part to the following two objectives:

Objective 1: To review the status of early childhood development transformation in post-Apartheid South Africa in the context of the local and global development goals.

Objective 6: To review how the South African (SA) policy framework for early childhood development impacts the quality of early childhood development learning environments.

2.4.1 CHILDREN AND POLICY

Globally, the position of children in society can be related to the perspectives of the United Nations *Convention on the Rights of the Child* (CRC), which describes the international standards for the rights of children (United Nations, 1989). Governments are therefore provided with a framework that can inform the development and implementation of policies

relating to children's health, education, and social development, which form the core of the integrated approach to early childhood development. The articles in the Convention further include positioning children as having unique needs, such as the right to play and have access to children's books. A further critical component is the need to support the best interests of children and to respect the views of children, confirming the acknowledgement that children must have agency and voice. The establishment of this Convention marked a paradigm shift in the position of children in society, from being an extension of their parents to independent role players in society. This positioning not only impacts governments and policymaking; it ripples out to all aspects impacting the study of childhood and children's development, education, and environments. Some of these points have already been highlighted in the background and research problem presented in Chapter One, where the positioning of children through policy determines the value and quality of early childhood development provision.

The right to education was initiated and promoted by the United Nations Educational, Scientific and Cultural Organisation (UNESCO)-led Education for All (EFA) movement, with the aim of making learning compulsory for all children by 2015. Critical to this movement was the extension of education to start from birth, initiating governments to include policies to increase the provision of early childhood development. However, research indicates that the focus on children below school going age was limited in the first decade after the rights of the child were established (UN Committee on Rights of the Child, Unicef and Bernard van Leer Foundation, 2006). The evidence of early investment in quality early childhood development (Ashley-Cooper and Van Niekerk, 2013; Heckman, 2016) provides further motivation for improved implementation of early childhood development for children generally, but particularly for those affected by poverty. It is concerning to note that reports indicate that quality early childhood development is still limited for children in developing nations and other vulnerable communities (Boyden, Dawes, Dornan and Tredoux, 2019a).

Consequently, the positioning of an individual child is still primarily dependent on several government policies as well as the cultural and social-economic setting of the child (Bronfenbrenner, 1979). The way in which we view childhood often determines how we may observe or implement the rights of children. Unwin (2019) questions the view of children as

separate from adults, referring to how we refer to children as 'they' or 'them' almost as if they may be from another species. He furthers this argument of the inherent child/adult sameness rather than difference in how we relate to our environments.

Fredman, Donati and Naicker (2022) extend this othering of children, more so poor children, to be an act of discrimination within the context of South African law. The increased focus on the voice of children in the participatory processes of research (Clark, 2007), co-design (Mäkelä and Helfenstein, 2016), and policymaking (Chawla and Van Vliet, 2017) is an attempt to transform this othering, and it is rooted in the child's rights perspective. Throughout my review of literature, I have noted that the role of children's rights is increasingly being included in research as a theoretical framework, the motivation or background for studies, and when determining the methodological approach for a study.

At the global policy level, the concept of sustainability has, in a similar manner, influenced the positioning of childhood as a critical concern. The principles of sustainability, as established by the United Nations Brundtland Commission (World Commission on Environment and Development, 1988), could be described as caring about the use of resources and securing the resources that we have in a manner that ensures their availability in the future. The Sustainable Development Goals of 2015 (SDGs) marked the global focus on social, economic, and environmental sustainability, with a specific aim to eradicate poverty. The SDGs are an extension of the Millennium Development Goals (MDGs), which established sustainable development goals with an emphasis on low-income countries. The SDGs, through broader and more equitable inclusion, reveal that high-income and low-income countries can be included in an interconnected system to promote and achieve sustainability for the future (Raikes, Yoshikawa, Rebello Britto and Iruka, 2017). Both the MDGs and the SDGs have a rights based perspective that builds on the *Convention on the Rights of the Child* and includes education for all and the holistic development of young children through a range of interconnected targets in terms of poverty, hunger, health, child mortality, education, gender, water, sanitation, and inequality (Raikes *et al.*, 2017). Embedded in the SDGs is the underlying principle of the value of early investment, which was discussed in Chapter One as critical for eradicating poverty (Black, Behrman, Daelmans, Prado, Richter, Tomlinson *et al.*, 2021).

SDG 4, target 4.2, prioritises early childhood development and specifically includes respecting the rights of children, acknowledging their unique needs and interests, and promoting their development at every stage of their early lives. A critical mechanism is the creation of access to quality early childhood development programmes for all young children, inclusive of gender, disability, and citizenship status (Unesco, 2016). The integrated nature of health, social, and educational development from birth is acknowledged as imperative for achieving quality early childhood development (Bernal and Ramírez, 2019). Furthermore, ensuring access to early childhood development for the most vulnerable communities and those living in poverty is underscored in the SDG target, as is the need for research and interventions to make this a reality (Abbas, 2012; The Consultative Group on Early Childhood Care and Development, 2016; Unesco, 2016).

The framework provided by the *Convention on the Rights of the Child*, the Education for All movement, and the SDGs initiated the process of equal early development for all children regardless of gender, culture, disability, or socio-economic status; however, research indicates that children living in poverty are not yet benefiting from quality early childhood development and specifically early learning. Statistics indicate that socio-economic inequality is still present globally, with 62 per cent of children attending an early learning centre, while only 20 per cent of low-income children are enrolled (Adlerstein and Cortazar, 2022). The argument presented by Aldridge *et al.* (2018) provides a view of the misconceptions surrounding poverty and early childhood development that continue to influence the way the ECD policy frameworks are applied. The misconceptions are listed below:

- Poor parents do not care about their children's education.
- Standardised tests indicate that poor children have limited experiences.
- The children are less intelligent and have limited knowledge due to these limited experiences.
- Poor children have access to the same quality of education as wealthy children.
- Poverty is the result of life choices made by families.

At the core of this argument is the need to shift the focus from the challenges and shortcomings of poverty towards the potentials inherent in the complexity and diversity of their context. Notably, this research is based on the US's urban poverty, which have greater

diversity than that found in the poverty of developing countries, often situated on the urban fringes and in rural contexts. Researchers on child development counter the argument of potential in poverty by considering the adverse impact of the stunting, stress, and lack of stimulation caused by growing up in poverty (Engle *et al.*, 2007; Boyden *et al.*, 2019a). However, the argument presented by Aldridge *et al.* (2018) emphasises that the way in which we as policymakers, government officials, researchers, architects, and educators position young children and see poverty directly impacts the developmental potential of children. Therefore, when governments allocate more funds per day to prisoners or even to primary and secondary school education than to early childhood development provision, their actions stem from an inherent othering or discrimination against young children generally and more specifically against the young children living in poverty (Phora, 2018; Fredman *et al*., 2022; Atmore, 2023). This disregard of the value of early investment in poor children means that they not only suffer from socio-economic poverty but also from learning poverty. "Learning poverty means being unable to read and understand a simple text by age 10" (Bendini and Devercelli, 2022, p. XV).

Children, particularly those in middle- and low-income countries, are still being impacted by poverty, despite the positive changes implemented as a result of the MDGs and SDGs (Boyden *et al.*, 2019b; Bendini and Devercelli, 2022). The policies implemented to address early childhood development have a holistic view of it, as nutrition and healthy living conditions are often addressed before education requirements. The inclusion of early learning and stimulation is stipulated in SGD 4; however, this SDG merely refers to the quality of the early learning, and does not specifically define the parameters of the quality required, leaving it open to a contextual interpretation (Excell, 2016; Boyden *et al.*, 2019b). The integrated approach to early childhood development is, however, widely accepted as providing the essential ingredients for quality early learning and development (Vargas-Barón, 2005; Bernal and Ramírez, 2019). As discussed in Chapter One, the integrated approach provides holistic child development through the combination of health, social, and educational needs and moves the childcare setting towards an early learning, care, and development centre. The focus of childcare or crèches used to be caring for children with the sole purpose of enabling mothers to return to work, with minimal consideration for learning and stimulation.

There is, however, evidence indicating the success stories of governments in developing countries that have implemented early childhood development and early learning that focus on low socio-economic groups. Bernal and Ramírez (2019) report on the relative success of the Columbian 'From Zero to Forever' plan (DCAS), which focused on delivering integrated child development to poor communities with an integrated pedagogic programme for children from zero to five. The initial intervention programme resulted in improved holistic development and continues to show positive changes, considering that the programme expanded exponentially from "126 thousand children in 2010" prior to the implementation of the DCAS, and the number of children impacted "increased to close to 1.2 million children by 2016" (Bernal and Ramírez, 2019 p. 102). The success of the DCAS strategy can be ascribed to the multiplicity of the interventions, which included increased enrolments as well as improvement of the quality of the existing early childhood development centres throughout Columbia. The range of interventions notably has different financial requirements, depending on the nature of what is required, which acknowledges that there is no one-size-fits-all approach to the complexity of their early childhood development context. The primary focus of the DCAS strategy seems to be the inclusion of a pedagogic programme as a mechanism towards quality, which one would assume requires trained educators and a child-centred learning environment. I noted that the latter is not included in Bernal and Ramírez's (2019) research report.

Researchers agree that the quality of the early childhood development required is not well defined; however, Bendini and Devercelli (2022) provide some baseline criteria for inclusion:

- Qualified educators and a qualified principal.
- Age-appropriate equipment and an age-appropriate curriculum.
- Safe and stimulating learning spaces.

To ensure that investment in an early childhood development programme is of value, interventions should ensure the quality of the programme and the environment (social and physical), and the programme should offer care and stimulation that is recognisably better than what it was before or at home (Bendini and Devercelli, 2022). This measure of quality is still very open to interpretation and leaves room for the continuation of inequality. It does acknowledge the complexity ingrained in establishing a universal approach to quality. It is

reassuring that the value of safe and stimulating learning spaces is included in the baseline criteria, and this is expanded on in Chapter Four (Adlerstein and Cortazar, 2022) of the book. The value of this exploration of quality lies in the attempts to develop actionable strategies with tools provided to empower governments in their increased provision of equitable quality early childhood development, recognising that it is through policy and implementation that the *Convention on the Rights of the Child* (CRC) can be lived out and SDG 4's target 4.2 can become achievable.

The proposed strategies for improving the quality of learning environments therefore start with the development of an early childhood development policy rooted in the CRC and the SDGs. The most effective policies have been identified to work towards the holistic development of children from birth to five years. Ideally, the policies should also integrate the maternity phase to acknowledge the value of maternal care for the unborn child. Integration from birth combines the health, social, and educational dimensions of children's development (Engle *et al.*, 2007). Although my research is focused on early education, which includes early learning, stimulation, and development, I acknowledge that the other dimensions are intertwined with nature to provide a holistic view of learning through the lens of the third space, as previously discussed. The integrated nature of early learning environments is supported to some extent in the strategies for governments proposed by Adlerstein and Cortazar (2022), but the strategies are primarily concerned with learning.

The strategies (Adlerstein and Cortazar, 2022) towards developing structural quality in early childhood development learning environments are targeted at countries that need to address inequality and poor access to early learning. The policy and strategies are rooted in the five key principles defined for quality early childhood development learning environments, as discussed in 2.3.3 and in Table 2-2, which indicates how these align with other research related to identifying what constitutes the quality of learning environments for young children (Moore and Sugiyama, 2007; Berti *et al.*, 2019; Matthews and Lippman, 2020). A phased approach is proposed to cater for the challenges that governments face when starting to implement investment in early learning by expanding the provision of centre-based early learning (Ashley-Cooper and Atmore, 2013; Tryfaini and Eleni, 2017; Bernal and Ramírez, 2019; Boyden *et al.*, 2019b).

The phased approach (Adlerstein and Cortazar, 2022) starts with a **situational analysis** to understand the existing conditions. It is based on the five principles of quality, which each provide questions that can help authorities determine the level to which the learning environment supports the needs of children, staff, and their communities. The framing of the principles as questions indicates similar framing to that in *The Pattern Language* (Alexander *et al.*, 1977), as discussed in Section 2.3.3., which identifies the reoccurring problems in the development of design strategies (overall safety, pedagogical organisation, spatial flexibility, empowerment and authorship, and child-centred design). Table 2-3 captures the principles of quality, and each one has a comprehensive list of questions that are aligned with best practice based on research to provide insight into the level of quality in the early learning environments (refer to Tables 2-1 and 2-2 that provide an overview of how researchers define the characteristics of quality in these environments). This approach to evaluation using questions is particularly suitable for countries that have a broad range of early learning provisions. It is evident that some of the questions are suitable for rural and under-resourced settings.

Table 2-3 Key Principles and Evaluation Questions

Key Principles of Quality Learning Environments	**Questions to Evaluate the Quality of Learning Environments**
Overall Safety	• Do centres meet minimal hygiene and safety conditions so that children can learn? • Is a clean water supply ensured for handwashing? • Is garbage disposal controlled? • Can light, noise, and temperature in the ECE centres be controlled so that children can engage in learning and playful experiences? • Are the materials and physical environments accessible to all children and adults? • Are the safety protocols and evacuation points known to all community members? • Do families and community members participate in ensuring safety and maintaining healthy practices?

Pedagogical Organisation	• Is the pedagogical value of everyday objects and spaces being recognised? • Have different areas and zones been organised for children to engage in various learning experiences? • Does the environment reflect what children are exploring, learning, and solving in their everyday lives? • Does the physical environment include learning aids that support different teaching strategies (clocks, books, new word panels, responsibility charts, and so on)? • Do children have access to places that foster different interactions and actions, such as sharing, exploring, moving, resting, collaborating, expressing, and so on? • Do children have spaces where they can rest, be calm, play, create, and run?
Spatial Flexibility	• Is the learning environment easily adaptable for different types of experiences and groupings? • Is furniture multi-purpose and easy to adjust for diverse uses? • Can furnishings be used as dividers and breakers of whole space? • Are children able to circulate and flow through the different learning centres? • Can children easily connect indoor and outdoor areas during learning experiences? • Are materials open-ended, inviting children to create, build, imagine, and solve? • Do natural and meaningful materials predominate in the learning environment?
Empowerment and Authorship	• Do children have opportunities to personalise their learning environments? • Do learning environments document and show children's thoughts, actions, and decisions? • Do teachers invite children to arrange spaces and exhibit their projects and learning processes? • Are displays child- and adult-made?

	• Do teachers have support to test new spatial arrangements and teaching places? • Do families, children, and teachers feel that their environment expresses a shared identity?
Child-centred Design	• Does the learning environment feel cosy and homey? • Does the learning environment include objects that children and the community treasure in their everyday lives? • Is the physical environment scaled to be within reach of all children? • Are there enough adults in the learning environment to interact responsively with children? • Does the ratio of children-to-educators allow children's exploration, free play, and collaborative learning? • Does the number of children in the learning environment ensure a comfortable noise level? • Does the size of the learning space allow children to move without disruption? • Can children see through the windows, or are they too high for them? • Does the learning environment include authentic and natural resources for learning, such as rocks, seashells, seeds, and branches? • Are walls painted and not overcrowded with visual aids?

Source: Adapted from Adlerstein and Cortazar (2022)

This form of evaluation would provide a strong basis for understanding the types of interventions required to address the limitations in terms of quality in the various early learning environments. As was noted in the Columbian case, a range of early childhood development types require different forms of intervention (Bernal and Ramírez, 2019). **Standards and regulations** are most often implemented to address inconsistent quality; however, this approach poses considerable challenges for low-income countries or those with vast differences in quality between high and low socio-economic settings, such as South Africa (Atmore *et al*., 2012a; Bernal and Ramírez, 2019; Madyibi and Bayat, 2021; Adlerstein and Cortazar, 2022). The research indicates that in most instances, standards are implemented without providing support and funding for upgrading or establishing new centres. Adlerstein and Cortazar (2022) report that only 10 per cent of the ECD centres were meeting the standards in Chile before support mechanisms were put in place. Therefore, the next step is

to **reflect on the challenges** that hinder these early learning environments and hamper their quality so that feasible interventions can be established to improve their quality. Funding mechanisms and support frameworks can only be identified once this has been done.

A further concern is that often these standards and regulations relate to the physical structure of the environment in terms of health and safety and do not address the other quality characteristics. The lack of a child-centred design, spatial flexibility, and pedagogic organisation often leads to institutionally designed school environments that do not meet the requirements for early learning quality. The regulations and standards are generally weak when it comes to participatory processes that enable empowerment and authorship. It is notable that the questions presented by Adlerstein and Cortazar (2022) are presented in a narrative format that lends itself to a qualitative approach to data collection, thus avoiding a checklist format that tends to be quantitative. Learning environment research and the range of responsive approaches to architectural design suggest that all the quality requirements can be achieved through participatory processes. Once achieved, the early learning environment (and early childhood development) will align with the CRC and the SDGs (Abbas *et al.*, 2012; Barrett *et al.*, 2019; Matthews and Lippman, 2020).

The other steps in the phased approach that governments could follow include:

- *"Step four - Calculate the quality gap. It is important to calculate the quality gap, that is, the distance between program reality and standards. This measurement can be used to determine the level of support needed.*
- *Step five - Support programs to achieve standards and bridge the gap by providing resources and technical assistance. This support can include resources for improving facilities, hiring staff, or providing technical assistance.*
- *Step six - Make standards official. For standards to work they need to be legally binding. Meeting standards could be a prerequisite for new programs. Old programs should be given time to make changes to meet new standards.*
- *Step seven - Develop a certification or monitoring system. An independent institution is helpful for assessing and monitoring standards. It is important to define how often programs need to be certified, to determine whether programs will be visited, and to*

> *outline the potential consequences of failing to meet standards"* (Adlerstein and Cortazar, 2022 p. 182).

A further mechanism is included to support the above steps, noting that the initial process tends only to work towards meeting the minimum requirements to provide safety and some degree of child-centredness. The inherent removal of the components of pedagogy, flexibility, and empowerment from the initial phases contradicts the notion of the learning environment as a place, third space, and third teacher that informs responsive architecture, as discussed in the preceding sections of this chapter (in particular 2.3.2). Adlerstein and Cortazar (2022) propose separate support systems through technical guides, advocacy programmes, or pedagogic systems; however, the separation goes against what research indicates to be more effective. The South African implementation of the scaling-up of early childhood development and centre-based early learning shows many of the pitfalls of a regulatory process implemented independent of pedagogy, flexibility, and empowerment (Madyibi and Bayat, 2021; Wills, Kotzé and Kika-Mistry, 2021; Peacock, 2022). This situation is exacerbated by the lack of a thorough situational analysis of the learning environments prior to implementation of the regulations and minimal financial and other support mechanisms to increase the quality of the learning environments (Ashley-Cooper, Van Niekerk and Atmore, 2019).

2.4.2 ECD IN SOUTH AFRICA

The position of children in South Africa has slowly shifted over the past three decades to reflect an awareness of early childhood as a critical period of human development. The shift was initiated in 1989 by the United Nations *Convention on the Rights of the Child*, earmarking the acknowledgement of a valued childhood. The South African political context further pushed a rights-based agenda when the first democratic government was established in 1996 with the national Constitution, which is internationally recognised for the value placed on rights. The Constitution's Bill of Rights provides for children's socio-economic well-being by mandating basic education and protection from neglect, abuse, and exploitation (Atmore et al., 2012a). The position prior to the reforms after 1994 included severe inequalities through the segregated system of the Apartheid government, where children grew up in completely different environments and received different forms of care and education based on their

cultural backgrounds. The period from 1994 to 2000 included the development of a range of policy frameworks to address inequalities at all levels of society.

The initial focus on educational reform did not include early childhood, and this was only included in 2001 with *Education White Paper 5 on Early Childhood Education - Meeting the Challenge of Early Childhood Development in South Africa* (DoE, 2001). Atmore (2018) considers the focus on basic education from Grades 1 to 12 as being driven by the need to address the inequalities of the previous dispensation, as well as being politically driven to deliver on election promises. Figure 2-4 illustrates the timeline from the inception of the *Convention on the Rights of the Child*, indicating how the global focus on children relates to the initiatives and policies that relate to early childhood development (ECD) in South Africa. The timeline further illustrates how ECD in South Africa forms part of the democratic agenda towards transformation and equality. Critical in the list of policies is the national Integrated Development Plan (NIDP) for early childhood development of 2015 (*National Integrated Early Childhood Development Policy* [Department of Social Development, 2015]), which is a sub-framework of the national development plan focusing on early investment in children's development.

As discussed in Chapter One, the national Integrated Development Plan (NIDP) for early childhood development is based on the holistic approach to this development, which is seen as international best practice bringing together all aspects of child development. The intention of the South African government is to follow through with the MDGs and this is in line with the Sustainable Development Goals established at the same time as the NIDP.

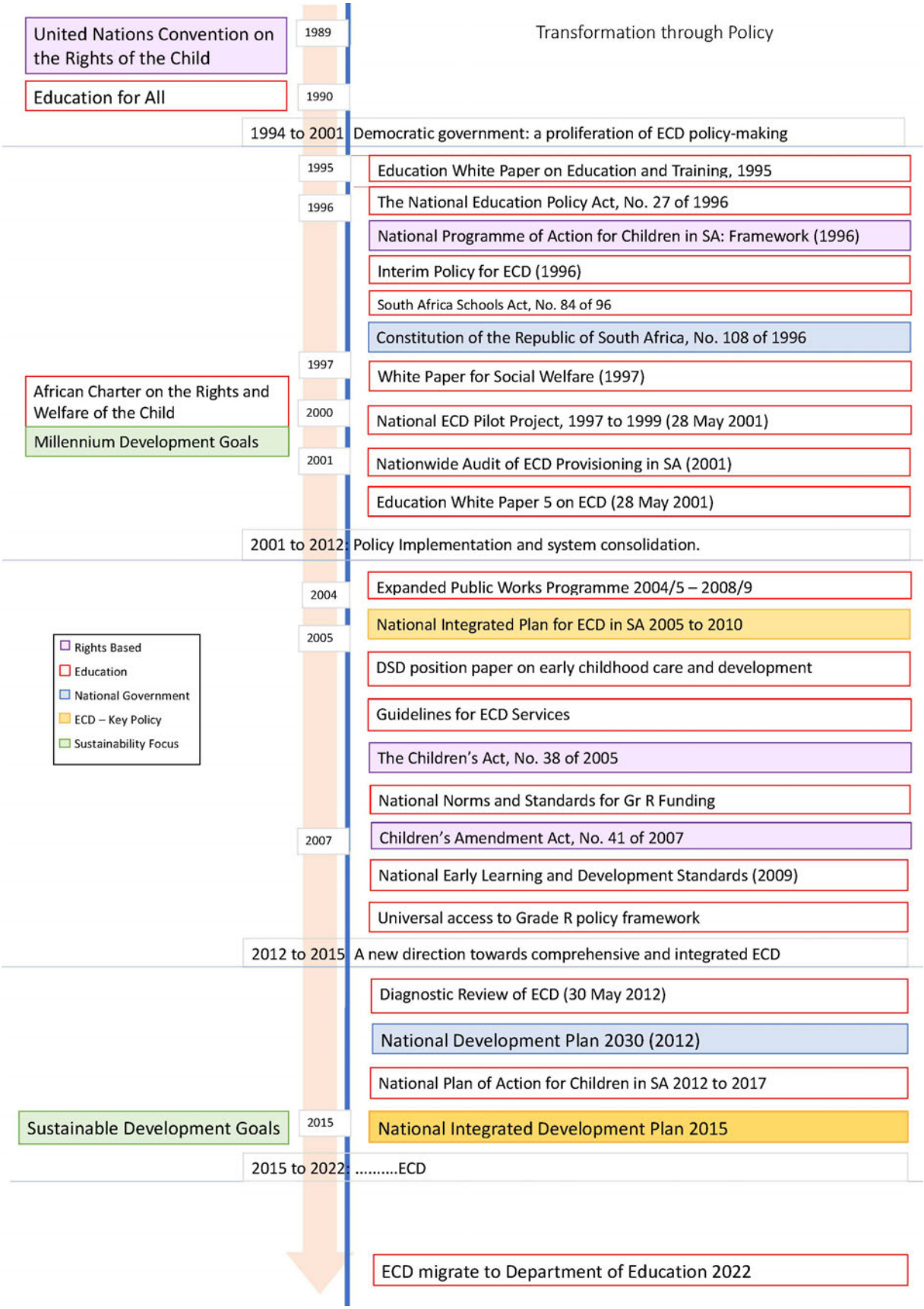

Figure 2-4 Timeline of the South African Policies Impacting Early Childhood Development

Source: Adapted from Atmore (2018)

The South African government defines “early childhood development (ECD) as an umbrella term that applies to the processes by which children from birth to at least 9 years grow and thrive physically, mentally, emotionally, spiritually, morally, and socially” (DOE, 2001). Fig. 2-4 illustrates the process and timeline followed to improve early childhood development in the country, which included various policies, projects, and plans to move towards the integration inherent in this definition. However, Atmore's (2018 p. iv) interpretative analysis argues that the policy development from 1999 to 2015 was “haphazard, contradictory, unplanned, and confusing”. Considering the complexity of how each of the policies, plans, Acts, and programmes is interconnected and sometimes contradictory, I have taken the view to focus only on key aspects in line with my research problem and objectives.

Prior to the Integrated Development Plan for early childhood development, the development of children was separated out between the different government departments as follows (Atmore *et al.*, 2012a):

- Birth to four: Department of Social Development
- Five to nine: Department of (Basic) Education
- Birth to nine: Department of Health

This allocation was aligned with White Paper 5, which provided for one year of compulsory preschool, a reception year (Gr. R), before entering primary education. Minimal inclusion of pre-reception formed part of the plan, thus marginalising children from birth to four years (Atmore, 2018). The primary focus of the Gr. R implementation was for it to be a precursor to primary education, with the intent to locate a Gr. R in every existing primary school (DoE, 2001). This approach suggested that funding for poor children could be managed by school governing bodies. Research indicates that this approach contradicted the findings of the ECD pilot project as it removed the focus on community-based ECD provision, which represents a more holistic approach to early learning (Atmore, 2018). Notably, the original five-year target for all children aged five to be enrolled in Gr. R has been challenging to fulfil, specifically because of the negative impact of the COVID-19 pandemic. Figure 2-5 illustrates the progression of Gr. R enrolment, with a marked drop during 2020 at the height of the pandemic and the number steadily improving thereafter (Hall, 2024).

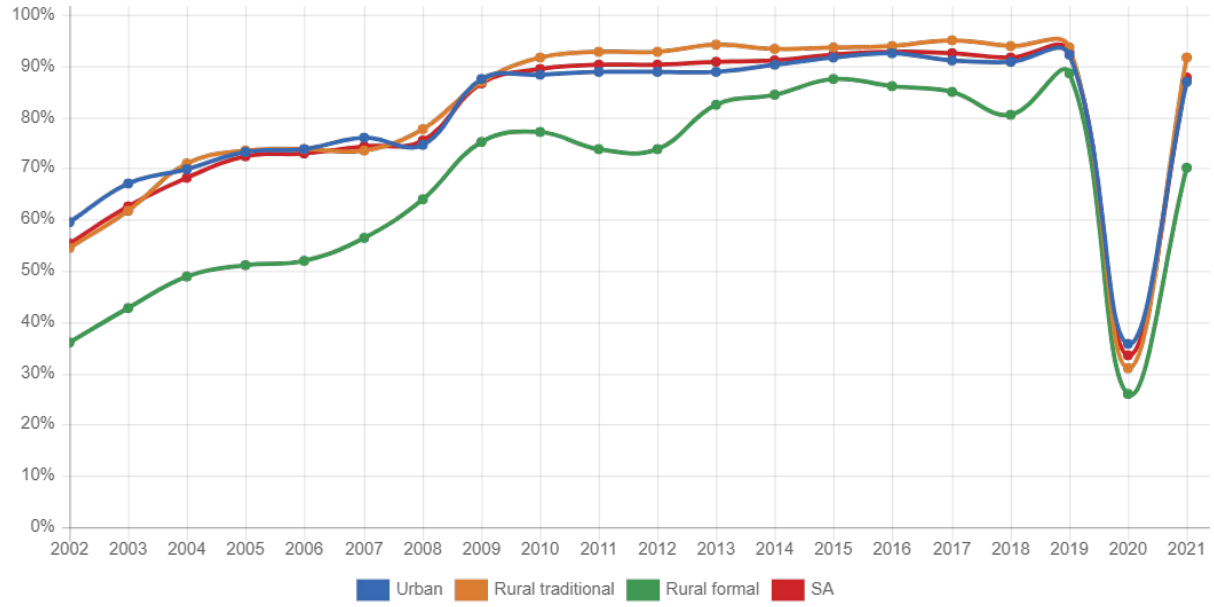

Figure 2-5 Enrolment Numbers for Grade R Since Implementation

Source: (Hall, 2024)

The statistics relating to the status of early childhood development in the country can be drawn from various reports aimed at monitoring the progress in line with the CRC, SDGs, and other international programmes. The latest early childhood development (ECD) review commissioned by the Children's Institute at the University of Cape Town and Ilifa Labantwana (Hall *et al.*, 2019) formed the basis for the background and motivation for my study, as detailed in Chapter One. This data has subsequently been supplemented by the ECD census data (Department of Basic Education, 2022b) and the Thrive by Five Index (Department of Basic Education, 2022a), which aimed to provide policymakers and researchers with a more accurate understanding of ECD in the diverse contexts of South Africa (Department of Basic Education, 2022b). The Thrive by Five Index (Department of Basic Education, 2022a) forms part of the transition of the ECD sector from the Department of Social Development to the Department of Basic Education. The data gives insight into the quality of early learning as part of early childhood development in the diverse contexts of South Africa.

Throughout the past two decades, researchers and activists have published reviews focusing on the progress and challenges faced by the ECD sector regarding its transformation. Researchers agree that the primary aim of the government's focus on early childhood

development is the provision of equal access to quality ECD for all children in South Africa. The major challenges identified to have impacted young children since 1994 include poverty, lack of education and healthcare, HIV/AIDS (Atmore *et al.*, 2012a), and more recently, the COVID-19 pandemic (Wills and Kika-Mistry, 2021). These challenges emerge as interconnected, and children living in poverty are still the most affected by them, according to the most recent data (Department of Basic Education, 2022b; Tredoux, Dawes, Mattes, Schenk, Giese, Leach *et al.*, 2023). The impact of HIV/AIDS is much less pronounced due to effective public awareness campaigns and medical interventions that have reduced the spread of the disease and provided longevity to those infected through antiretroviral treatment (Atmore *et al*., 2012a). However, many children have been orphaned and live in child-headed households, exposing them to further risks of poverty and leading to school drop-out. Hall *et al.* (2019) report that there have been positive interventions in terms of child health and maternal care and point out that these advances have been enabled through various programmes that provide access to health services. Notwithstanding these improvements, access to food and nutrition is still reported as a concern impacting directly on children when considering their early learning assessments reported in the Thrive by Five Index (Tredoux, C., Dawes, A., Mattes, F., Schenk, J.-C., Giese, S., Leach, G., *et al.,* 2023).

Research indicates that there has been a positive change in the number of young children living in poverty, as the figure has reduced from 78 per cent over the past decades to 56 per cent in 2019 (Hall *et al.*, 2019). However, the negative impact of poverty on early childhood development is consistently raised in all the literature on the 0-6 year age group (Atmore *et al.*, 2012a; Ashley-Cooper and Atmore, 2013; Hall *et al.*, 2016; 2019). The impact of poverty is multi-layered and starts in the home, with potentially less stimulation and parental interaction. The home environment often represents various health and safety challenges related to access to water, sanitation, electricity, safety from fires, and a lack of environmental comfort. Poor households often have limited resources for food and other general household goods (Ashley-Cooper *et al.*, 2019). The opportunities for these children to attend a quality early learning centre are limited due to costs and the lack of registered ECD centres in their communities (Nelly and Matjokana, 2023). In contrast to the advantages of early investment in children's development, all of the above influences of poverty negate the inherent potential of early child development, thus furthering the poverty cycle.

When unpacking the challenges that continue to limit access to early learning (ECD centres) and impact the quality of the ECD services, the following key challenges emerge:

- Enrolment numbers.
- Teacher training.
- Government funding.
- ECD programmes.
- Condition of the infrastructure.
- The ECD centre's registration status.
- COVID-19.

The section below will map these challenges through an analysis of the literature to understand their causes and implications. It will also highlight how these challenges have been addressed through effective interventions. A chronological format is followed to illustrate how the challenges reported in 2006 have either been addressed or remain consistent.

The Education for All monitoring report from 2006 (UNESCO International Bureau of Education, 2006) provides an overview of the early childhood development statistics in South Africa following the implementation of White Paper 5. The report has limited data but highlights the positive aspects of a learner-centred pedagogic approach with the inclusion of literacy, numeracy, and life skills. It also raises concerns about the capacity of the educators, as most of them do not have the appropriate qualifications. A further concern is the lack of government funding for the community-based centres, particularly those that serve the many children in low socio-economic settings. The poor condition of the infrastructure is also noted as a major concern.

The report by Biersteker and Streak (2008) focuses on the challenge of teacher training and considers the relationship between improving early childhood development and the career paths of the predominantly unskilled female ECD workforce. The need for educators and managers to be educated and equipped to ensure quality is emphasised in line with the Education for All report and the requirements set out in White Paper 5. Another major concern identified is the workforce's conditions of service, which include low salaries. The requirement to register with a professional teachers' association is noted as problematic as well, as there

is no mechanism in place to facilitate this. The upgrading of educational levels/qualifications to meet the job requirements is also challenging, with no government funding allocated for this and the inconsistent quality of the training colleges, as many of them are not accredited training facilities.

The review article by Atmore *et al.* (2012a) confirms the progress of the ECD sector following the intervention of policy development and implementation that has led to more children being enrolled in better quality early learning facilities as a result of the implementation of Grade R. The increase in the annual government budget for early childhood development is commended, as 58 per cent of the ECD centres have received funding by this stage. The major concerns highlighted for children aged 0-4 include the lack of infrastructure, nutrition, ECD programmes, teacher training, institutional capacity, and funding. In a related paper focusing on the contradictions between policy and reality, Atmore *et al.* (2012b) report that although the political will for ECD transformation is evident, it is hampered by the extent of the challenges and what it would take to achieve the political goals. The authors consider the key challenges of poor infrastructure and inadequate staff training and highlight the contrast between the promise of extending pre-schools to include a pre-Grade R class (a second compulsory year) for all children and the infrastructure challenges that have to be overcome to make this a reality. They achieve this by estimating the number of classrooms that need to be constructed, the number of additional teachers required, and the cost implications of both. They consider the extent of the poor quality of the ECD infrastructure, which includes centres that lack water, electricity, and sanitation, and report that the Education for All report (UNESCO International Bureau of Education, 2006) reveals similar problems with the sector's infrastructure. They conclude that the shortfall in the funding required to upgrade the existing infrastructure has yet to be addressed. They also conclude that the cost estimates to build new classrooms mean that the plans to build them are unrealistic, given the funding mechanisms and the government's budget allocations for the process (Atmore *et al.,* 2012b).

The primary concern with the infrastructure is embedded in the differentiation between community-based centres and early childhood development (Gr. R) provision located in primary schools. Community-based ECD centres have not received funding to construct or maintain their learning spaces. At this point, the NIDP for early childhood development still

requires the ECD provider to meet the minimum standards for infrastructure to enable their registration as learning centres; however, this has to be done without any support from the government. The findings by Atmore *et al.* (2012a) indicate that the registered community-based ECD centres are of poorer quality than the Grade R facilities at public schools, which do receive government funding. Furthermore, ECD centres that have not achieved registration status will subsequently not meet the minimum norms and standards and have no resources for improvement (Atmore *et al.*, 2012a). These particular issues have been highlighted by more recent studies confirming that no progress has been made to review and alter the funding model (Sotuku, Okeke and Mathwasa, 2016; Madyibi and Bayat, 2021; Nelly and Matjokana, 2023). Atmore (2018) elaborates on this point, stating that there is still no formal government funding mechanism for the early childhood development of 0-4-year-olds. Although conditional grants are allocated for poor children, this funding is dependent on the registration status of the ECD centres, and many of them are not registered. It is therefore evident that the funding model is inadequate and impacts the most disadvantaged children severely, perpetuating the poverty cycle, as previously highlighted. Atmore *et al.* (2012b) conclude that "the main challenges (to ECD) are: political will, systemic challenges, and implementation challenges", and this conclusion is particularly relevant in terms of the infrastructure challenges.

The funding challenges are further complicated as there are variations between the provincial budgets and in how funding is allocated (Atmore *et al.,* 2012a). The Western Province government provides a smaller grant for each child to allow more children to be funded, and this differs from the other provincial governments that provide a slightly higher grant but include fewer children in the allocation of these grants. Another problem inherent in the funding is that it is based on the number of children, and there are no separate allocations to cater for their nutritional requirements, the infrastructure requirements, the teachers' salaries, or the teachers' training. Atmore *et al.* (2012a) add that the community-based ECD centres either fund the nutrition themselves or the parents send food to school. Registered community-based ECD centres are supposed to be funded as part of the grant allocation per child; however, the grant money is most often also used for administration costs and staff salaries. This means that there is little funding available to ensure optimal nutrition, and these ECD centres are reliant on NGOs and other donors for support.

The funding for early childhood development was reportedly increased; however, Atmore *et al.* (2012a) state that as many as 25 per cent of the community-based ECD centres have yet to receive funding from either the DSD or the DBE.

Furthering the concerns related to teachers, Atmore *et al.* (2012a) report that the norms and standards provide no qualification requirements for early childhood development and Grade R teachers. The remuneration for Grade R teachers is also substantially lower than that for teachers in the primary education system. The concern regarding training providers and their lack of accreditation is consistent with the findings of Biersteker and Streak (2008), indicating that no advances have been made towards resolving this challenge at this point. The impact of inadequate teacher education and their poor conditions of service have created a further challenge relating to quality in terms of the teacher-child ratio. As discussed in Section 2.3.1, a low teacher-to-child ratio is the international quality standard to ensure that young children are placed in smaller groups that allow optimal teacher-child interaction and avoid crowding (Moore and Sugiyama, 2007). The number of qualified teachers (and lack thereof) thus directly affects the quality of early childhood development.

Atmore *et al.* (2012a) critique the government for lacking an implementation plan in line with the National Development Plan and comment specifically on the lack of provision for the 0-2-year-old age group. Reference is made to the success of the Sure Start programme in the UK, which is directed at these younger children in children's centres (ECD centres) and community centres (CABE, 2008) and others based in the US. The success of the UK system at this point could be ascribed to the integration of early childhood development services with social services to support parents. During my stay in the UK, I was involved, as an architect, in the design proposals and development of the design guidelines for ECD facilities and can confirm that the process was funded by the UK's Department of Education, included consideration for play groups and adults skills development, and provided child-centred learning environments (Cloete, 2016).

The range of ECD programmes in South Africa includes the traditional centre-based ECD model and non-traditional ECD provision that includes playgroups and family outreach programmes (Atmore *et al.,* 2012a). The preceding discussion focused on centre-based (traditional) ECD provision only; however, best practice precedents in other countries have established

mechanisms to accommodate non-traditional services through national programmes. It is thus critical to consider what else is offered in terms of early childhood development but is not included in any of the government's plans. Non-traditional forms also include a type of centre-based ECD where an ECD provider converts spaces in their home for use as classrooms for this purpose. The other two predominant forms of non-traditional ECD include family outreach programmes and playgroups. These provisions are usually supported by ECD NPOs and sometimes by government departments that intervene in home- and community-based facilities by providing trained personnel. The aim of these programmes is to empower families in the care of their young children when they cannot afford centre-based care; however, this should ideally take place as part of an integrated system as non-traditional ECD receives less funding (Atmore *et al.*, 2012a).

Atmore *et al.* (2012a) postulate that appreciation for the value of quality ECD provision and higher regard for educators and the importance of their role in society are vital for the transformation of ECD. Unfortunately, in 2012, after 18 years of democracy, understanding of the complexity of what is required to achieve the goal of access to quality ECD is still not evident in the government's systems. This is apparent in the lack of competency of the ECD officials, the lack of cooperation with the non-profit system, and the unrealistic funding and implementation strategies. In contrast, Ashley-Cooper and Atmore (2013) provide evidence of the positive impact of interventions at this point, indicating that transformation can be achieved through focused, integrated interventions and working with communities.

The research by Biersteker, Dawes, Hendricks and Tredoux (2016) follows the implementation of the NIDP for early childhood development and uses internationally recognised ECD quality assessment tools to provide evidence of the quality of the early learning programmes in South Africa. The research is based on international literature indicating that the quality of early learning programmes has a direct bearing on the effectiveness of early investment in children's development, specifically in terms of school performance. The research includes the Early Childhood Environmental Rating Scale—Revised (ECERS-R), the Infant–Toddler Environmental Rating Scale—Revised (ITERS-R), and the Centre Management Quality Measure based on the requisite South African standards. The research is set on the solid foundation of the complexity of defining quality early learning and its inherent relativity in different contexts,

which is reported through contrasting outcomes based on cultural influences. The authors confirm the establishment of the National Early Learning Development Standards (NELDS) (Department of Basic Education, 2009) in 2009 and the National Curriculum Framework for Children from Birth to Four (Ebrahim and Irvine, 2015) as positive mechanisms that include a holistic pedagogic approach and lean towards a learning through play approach. Biersteker *et al.* (2016) identify a trend towards lower-quality ECD environments in countries with similar demographics in the Global South.

The findings from this research indicate that centres located in low socio-economic areas provide lower-quality development programmes, confirming the conditions previously reported by Atmore *et al.* (2012a). A correlation is evident between teachers' wages, enrolment fees, and classroom quality, and these authors state that this finding is supported by evidence from international studies. Another factor impacting negatively on quality is an ECD centre management team with limited knowledge and understanding of good practice in early learning. However, when opportunities for professional development are available to staff, improved quality is evident. Unfortunately, the quality of the teaching of younger children is negatively affected as better-educated educators are placed with older age groups. This finding suggests a general misconception that school readiness is more valuable than the building blocks established in the 0-3 age group. Biersteker *et al.* (2016) confirm the finding that the quality of the early childhood development of younger age group classes is consistently lower than the quality experienced by older children. The authors also confirm the critical need for the government to engage with researchers to develop an evidence-based policy for early childhood development, suggesting that there is a divide between reality and policy, as previously highlighted by Atmore *et al.* (2012a). Furthermore, the application of recognised quality assessment tools provides greater depth of understanding of how the challenges previously discussed regarding staff training and lack of funding exacerbate the conditions in the early learning centres in the most disadvantaged areas.

The increased access to early childhood development in the disadvantaged areas reported by Hall *et al.* (2019) is thus not a true indication of transformation, as poorer children are generally accommodated in ECD centres with poor quality. "There are no national data on the quality of early learning programmes in South Africa, although several studies have shown that

poorer children are more likely to receive poorer-quality programmes" (Hall *et al.*, 2019, p. 28). The discourse around poor quality early childhood development and poor children is furthered through the lens of inequality by Ashley-Cooper *et al.* (2019). The inequality faced by poor children, more specifically poor African children, continues to present itself throughout all aspects of child outcomes (cognitive, language development, numeracy, health, and socio-emotional development). The impact of lower child outcomes leads to children starting formal schooling in an unequal position compared to wealthy children. This inequality is further widened by what is reported as a dysfunctional schooling system, and this hampers the opportunity for remediation. According to Ashley-Cooper *et al.* (2019), the most effective way to reduce the inequality of children growing up in poor households is to maximise the time and quality of their holistic early learning and care. This argument is supported by international research findings and the principles of early investment (Heckman, 2016; Black *et al.*, 2021). Ashley-Cooper *et al.* (2019) further indicate that the multiple forms of inequality in the ECD sector that were reported on by the same authors in 2012 remain, as the challenges have not been addressed effectively. The development of the National Integrated Development Plan for ECD indicates an improvement in political will; however, concerns are raised that the implementation is vague. Atmore (2018) and Ashley-Cooper *et al.* (2019) add that there are significant limitations in terms of the government and non-profit organisations supporting the ECD sector. Their recommendations towards reducing the inequality stress that the government must ensure capacity-building, increase the funding for the sector, and work within the framework of the SDG targets to achieve real transformation. The authors further state that the limited availability of accurate data on ECD provision hampers the progress towards reducing these inequalities and developing quality access. The question of quantity (more access) versus quality (of the ECD) is explored by Venter (2022), using a systems dynamics simulation to investigate the differences in outcomes between increasing enrolment and improving the quality of the South African ECD centres. This systems approach could be applied to assist the government with ensuring that increased ECD centre provision is consistent with the requirements for quality. However, the literature indicates that it is not clear if the government interacts with and responds to the evidence provided by research.

Furthering the discourse on quality, Ashley-Cooper *et al*. (2019) elaborate on the critical nature of the interpersonal interactions between the children, the teachers, and the parents

and highlight that this directly impacts the quality of the early childhood development provided. However, the value of the physical learning environment seems to be restricted to health and safety, with some reference to an enabling environment and a general disregard for the potential of the environment as a place and provider of silent lessons as a third teacher. Furthermore, the relationship between the interpersonal interactions and the environment as a third space is not included in the elaborate discussions about quality (Biersteker *et al.*, 2016; Ashley-Cooper *et al.*, 2019). In a more recent study by Dirks and Roy (2022), I found the only South African studies that mention the learning environment as the third teacher; however, this is not explored in any detail. The research includes a focus on community engagement and empowering parents and teachers working within the socio-cultural domain, which relates well to the rights-based approach of the third space (Soja, 2010) towards spatial justice.

Considering the statistics that indicate that a high number of young children are cared for outside of centre-based early childhood development, Molebogeng Diale (2019) argues that the unequal transitions from the ECD (home or centre-based) to formal education in Gr. R or Gr. 1 influence children's progress in school. He highlights the advantages of the structured nature of centre-based early childhood development compared to the lack of routine that often exists outside the centres. The challenges of poverty include single parents who navigate different forms of childcare while they work. The limitations of these arrangements are a direct result of not yet achieving equal access to quality early childhood development for all South African children, as set-out by the Education for All and SDG agendas. Molebogeng Diale (2019) confirms the positive impact of the integrated development approach, while also noting that the integration is a work in progress. The further challenge of rural-urban migration and the influx of refugees and other migrants from African countries have increased the number of children requiring early childhood development. The position of the migrants, whether in-country or cross-border, often means that their children are raised in challenging conditions, such as informal settlements or areas of urban decay, adding to the number of children living in poverty. Therefore, the key challenge identified of providing sufficient spaces for quality early childhood development for the most vulnerable remains consistent with previous researchers who have identified the same challenge.

The definition of vulnerable children is complex, as argued by Pillay (2018), and includes the dimensions of material problems (poverty in a general sense), emotional problems (lack of a normal loving and supportive family), and social problems (risk through their immediate social environment), as well as forms of disability, abuse, and illness such as HIV/AIDS. Vulnerable children, as with orphaned children, are more at risk of missing the inherent potential provided by quality ECD. Critical to the argument by Pillay (2018) is the rights-based view that ECD is no longer meeting the needs of these children, despite their right to access to quality ECD. The differentiation positions the child as central to the discourse and moves beyond meeting the minimum requirement when their psychological and social experiences are considered along with their educational outcomes. This shift enables the theoretical lens of social justice to become appropriate as it speaks directly to the severe inequalities resulting from the continuation of the challenges to ECD provision. Pillay (2018) furthers his theoretical approach through the ecological systems theory (Bronfenbrenner, 1979) and uses it as a framework to understand the multi-layered complexity of the context of poverty in line with research from the environment-behaviour discourse, as discussed in Section 2.2. This will be furthered in Section 3.3 as part of the theoretical framework of my research.

The onset of the COVID-19 pandemic had severe implications for the already vulnerable ECD sector in South Africa (Wills, Kotzé and Kika-Mistry, 2021). Berry, Biersteker and Rantsi (2021) report that the impact on the ECD centres included a range of factors, including:

- Closure of ECD centres.
- Suspension of ECD subsidies.
- The struggle to reopen ECD programmes.
- Loss of jobs and livelihoods.

The closure of all ECD centres and schools on 18 March 2020 started a severe decline in enrolments beyond the reopening of the centres, as illustrated in Fig. 2-5. Officially, ECD centres could reopen on 6 July 2020; however, this was subject to meeting the required protocols and safety standards. Furthermore, the reopening required a departmental inspection to approve the measures taken to provide a safe environment. Research indicates that the majority of ECD centres only reopened after August 2020, and attendance was low. Berry *et al*. (2021) report that the impact of the first lockdown on ECD providers was the loss

of incomes as caregivers stopped paying fees. This meant that the ECD centres could not afford their operational costs, which included paying salaries to staff. A major concern for centre owners and staff was that they would not be able to re-open.

Research considering the impact of the COVID-19 pandemic ranges from initial studies on the first closures due to the lockdown imposed to how the pandemic has continued to impact access to ECD (Wills and Kika-Mistry, 2021; Wills, Kotzé and Kika-Mistry, 2021). This research indicates how the challenges inherent to the government's funding model have affected enrolment during the period of economic challenges and increased unemployment that has followed as a result of the lockdown imposed. The impact of the pandemic on developmental school-readiness losses is included in an international study from the relatable context of Uruguay, South America (González, Loose, Liz, Pérez, Rodríguez-Vinçon, Tomás-Llerena *et al.*, 2022), which also saw an increase in inequality. Children from disadvantaged backgrounds were more severely affected in terms of their developmental trajectory compared to children from high-socioeconomic backgrounds. Considering the challenges already reported as impacting the most disadvantaged children in South Africa, we can assume that the same impact would be true in our context. Research investigating the holistic development of at-risk children in the rural areas of South Africa (Koen, Neethling, Esterhuizen and Taylor, 2021) indicates a similar trend in the negative impact of the closure of ECD centres. The research further proposes that participatory processes involving educators and parents in toy-making could be applied to build capacity in the context of vulnerable communities. This finding aligns with the original approach in the Reggio Emilia system, which acknowledges the concept of the third teacher (OWP/P Architects *et al*., 2010; Hall, 2017).

A further dimension of the COVID-19 pandemic's impact was the loss of food support (Berry *et al*., 2021), meaning that the existing challenges regarding nutrition were further exacerbated during the period. Research has shown that disadvantaged children rely on the food provided by schools and ECD centres for their daily sustenance. In Berry *et al*.'s (2021) study, the impact of the pandemic is focused more on parents (carers), who may already be in dire position due to loss of employment, the additional burden of home-schooling older children, and other stresses due to limited support. Thus, from an ecological systems perspective (Bronfenbrenner, 1979), we can see how the support network of the family, ECD

centres, places of employment, and government systems (grants) was removed by the lockdown restrictions. Berry *et al.* (2021) also elaborate on the layered system to identify the interrelated nature of the ECD context and how socio-cultural and environmental systems contribute towards quality ECD. This approach aligns with Dirks and McIntyre's (2021) view on societal intersections towards the positioning of childhood and how that impacts vulnerability. Their works also include the ecological systems conceptualisation of socio-physical environmental influences on children, including COVID-19 and its particular impact on society and ECD due to closure. The value of the research by O'Keeffe, Southwood and Hayes (2022) lies in its qualitative approach, which brings with it a greater depth of understanding of the challenges previously reported. Furthermore, the conceptual and analytic framing of quality as a complex system resonates with what I found when exploring the quality of the ECD learning environments, which combines place, the third teacher, and the third space in a multi-layered ecological context (see Section 2.3.).

Notwithstanding, the crisis created by the pandemic due to the delayed re-opening of ECD centres and the suspension of subsidies for these centres initiated a process of legal action, which indicates a mobilisation towards social justice for ECD (Ally, Parker and Peacock, 2022). In the evidence presented by Ally *et al.* (2022), it emerges that the ECD sector remains an unseen sector that has become voiceless as a result of the multiple government departments that represent it. The confusion between the DSD and the DBE in respect of ECD became evident enough to initiate the departmental shift in 2022, and the DBE is now solely responsible for the sector. However, the challenges discussed in the preceding section, which elaborated on the range of ECD programmes and the number of unregistered ECD centres, further complicate how the sector is represented. Notwithstanding, civil society organisations and a group of other stakeholders successfully completed legal action to insist that the closure of the ECD centres is unconstitutional. The legal action specifically highlights how the closure can be considered a violation of various children's rights, which, according to Fredman *et al*. (2022), could be defined as discrimination. It should be noted that evidence indicates that the implications of the COVID-19 disease are shown to affect children with less severity than adults. However, the lack of holistic early learning and care, including access to nutrition, will have long-term effects on the children (The Children's Institute, 2021; Ally *et al.*, 2022). This

approach validating the reopening has since been confirmed by the impact of the closures in the studies by González *et al.* (2022) and Koen *et al.* (2021), among others.

Following the conundrum of the ECD centre closures and suspension of the grant payments during 2020, the government seems to have prioritised the sector's departmental migration from the DSD to the DBE in April 2022 (Dirks, 2021; Ally *et al*., 2022). The ECD census (Department of Basic Education, 2022b) provides essential statistics on the state of the ECD sector prior to the migration. However, criticism about the move includes the inherent tendency towards meeting school readiness (Dirks and Roy, 2022) rather than towards the multidimensional nature of holistic ECD. The focus on the pre-Grade R year is twofold: to increase ECD provision to younger children through the additional compulsory year, and to formalise the ECD provision as is already done with Grade R. There is more equality in terms of funding for the sector through the Grade R system. There is, however, a lack of clarity on how this will impact the existing unregistered ECD centres and the children who are not able to access formalised ECD provision. It is not clear how the 0-4 age group will be accommodated within the DBE's management system. As the move is fairly recent, it is too early to establish whether this will assist in addressing the many challenges to ECD that have remained evident since the early 2000s. Dirks (2021) reports on the views from academics, ECD experts, and other stakeholders that range between optimism about progress, reservations about whether or not the move will make any difference, and questions about the readiness of the DBE to take on this new responsibility.

A recent critique by Atmore (2023) of the statements made by President Ramaphosa highlights the disjunction between political aspirations and the reality of the challenges faced by the sector, stating that the situation has not changed. The article raises the same concerns about access (only 30% of children are enrolled), inadequate infrastructure, specifically in disadvantaged communities with minimal government funding and support, the registration challenges that persist, and the low budget allocation for the ECD sector. A further reality highlighted is that the pre-grade R year has not been implemented 20 years after this was first proposed. Thus, Atmore (2023) confirms that the progress towards the intended transformation of early childhood development in South Africa remains challenged. However, there are opposing views on how we measure transformation in the context of South Africa

when viewing child development from a non-Western perspective. The premise of early investment can be questioned when it is focused on the economic return of investment as opposed to investing in a holistically developed healthy child within the cultural domain of Africa (Rudolph, 2017; Murray and Rudolph, 2019; Rudolph *et al*., 2019). The concern refers to how the school readiness drive and data practices, which focus on the measurable outcomes of numeracy and literacy, provide a Western lens. This criticism validates the need for further research that is more in line with the ecological systems (Dirks and McIntyre, 2021) and qualitative approaches (O'Keeffe, L. R., Southwood, S. L. and Hayes, N., 2022) presented in the preceding discussions to avoid furthering the marginalisation of the most vulnerable children.

2.4.3 POLICIES AND THE ROLE OF LEARNING ENVIRONMENTS

The relationship between education and policy is often directed by the government, through policy developers, towards education for implementation. Although the notion of evidence-based practice in all sectors of governance has become the desired approach, the process may lack independent or critical thinking as research is included to support the policy, and confined to actions by the government towards achieving specific outcomes, rather than providing alternatives (Ozga, 2000). There is no fixed definition of policy using this lens, as the definition and terms used are dependent on the researcher's position, making it more difficult for the reader to understand the researcher's thinking. If policy can be defined in a broader sense as the process of negotiation between various stakeholders, the focus on the process allows for the inclusion of teachers, parents, and departmental representatives involved in the formal policymaking processes (Ozga, 2000).

However, central to understanding policy from an environment-behaviour perspective is the suggestion that children's places are constructed through policy (Kraftl and Blazek, 2015). In the preceding discussion, the vulnerability of children growing up in poverty was elaborated on to consider the severity of the environmental impact (Pillay, 2018). Therefore, this research needs to consider what kinds of places exist for children and can be constructed within the South African policy framework. Wood (2020) argues that when considering the critical role of the physical environment that facilitates education, the school (ECD centre) becomes an expression of built policy. This approach is extended through research by Könings and

McKenney (2017), who state that the alignment between the learning environment and the curriculum is often mismatched due to vague policy. Their response to enable better alignment between the curriculum, learning environment, and policy is the use of participatory processes, thus echoing the views of Ozga (2000).

In the South African context, the literature repeatedly finds the conditions of the infrastructure, facilities, and classrooms to be challenging (Atmore *et al.,* 2012a; Biersteker *et al.*, 2016; Ashley-Cooper *et al*., 2019). From a rights perspective, Fredman *et al*. (2022) consider how the lack of quality facilities for early childhood development can constitute indirect discrimination, specifically towards poor children. However, minimal research investigating the condition of learning environments has been found, confirming the findings from the literature review in Section 2.2.3 that the field of learning environment research is not yet established in South Africa. The case studies on the physical environments for early childhood development (Sotuku *et al*., 2016; Madyibi and Bayat, 2021; Nelly and Matjokana, 2023) in either rural or disadvantaged settings provide some deeper insights, and each presents a contribution towards understanding the relationship between policy and learning environments. The recent early childhood development audit (Department of Basic Education, 2022b) provides a broad overview of the conditions of the ECD centres that includes aspects of the strategy used by Adlerstein and Cortazar (2022) to evaluate learning environments, as presented in Section 2.4.1.

The research by Sotuku *et al*. (2016) investigated the physical environments of ECD centres in rural Eastern Cape and provided a review of literature underscoring the value of the quality of the learning environment as a third teacher. The findings, however, indicated that the physical environment barely met the required health and safety norms and standards. Notably, these centres seem to have been constructed prior to 1994 and have not been upgraded since the implementation of the policies discussed in Section 2.4.2. The authors suggest that architects and educators are not well informed about the value of the learning environment. This finding seems to ignore the fact that the centres have not received any funding, which would have enabled the educators to make improvements. A further limitation of the findings is that the history of the buildings is not considered, suggesting that the buildings may have been constructed without architectural designers, as is often the case in rural areas of South Africa.

However, the study does raise the concern that the stakeholders, namely the educators, architects, government officials, and policymakers, do not have the same understanding of the value of learning environments, suggesting the need to establish a guideline or toolkit for standardised quality measurement.

The comparative case study by Madyibi and Bayat (2021) provides evidence of how inequality is exacerbated by the registration criteria of the policy framework in the low-income area of Philippi in the Western Cape. The evaluation includes the following range of criteria: the built environment context (formal/informal); the construction and materials of the building; the spatial layouts of the learning areas; the display of learning materials; outside play areas; the safety of the environment; and the ablution facilities. All of these indicate high quality at the registered early childhood development centres and poor quality at the unregistered early childhood development facilities. The authors indicate that the unregistered centre managers are unable to improve the quality of their centres due to a lack of funding. A further concern raised is that the centres in the informal areas are further challenged by their lack of land ownership and the zoning criteria of the land that they are located on. The research recommends the following potential ways that the government could intervene:

- The government should take responsibility for building early childhood development centres, specifically in low socio-economic areas that include informal settlements, following the success of Gr. R implementation.
- The government should establish state funding mechanisms earmarked for early childhood development facilities.
- They should build early childhood development centres at schools with available land.
- They should redevelop the policy framework to include an incremental approach for private early childhood development owners to access funding to improve their facilities.
- The government should engage with communities to find affordable solutions rather than merely imposing regulations.
- The government needs to conduct further research to establish the impact of the learning environment's quality on child development and outcomes.

These recommendations confirm the sentiments of other authors (Atmore, 2023) for the government to take responsibility for the establishment of quality learning environments, specifically for poor communities. Furthermore, the focus on community engagement aligns with the responsive approaches discussed in Section 2.3.2, as well as the strategies proposed for developing countries by Adlerstein and Cortazar (2022).

The research by Nelly and Matjokana (2023) considers how the limited access to resources, which includes the environment in marginalised communities found in rural and semi-rural settings, extends inequality. The research includes a qualitative approach and gives voice to the early childhood development centre owners in their plight to provide quality ECD services. The finding concurs with the previous research (Sotuku *et al*., 2016; Madyibi and Bayat, 2021) that reports the severe lack of quality of the learning environments and the severity of the limitations posed by the registration requirements and funding model. Notably, the findings indicate that government officials and early childhood development practitioners would benefit from clear guidelines and monitoring tools towards a collaborative approach to quality early childhood development. The research also suggests the inclusion of early childhood development centres in existing primary schools, which have better access to resources.

Throughout the review of the literature, which considers early childhood development and the learning environments in South Africa to support the sector, authors indicate the inconsistency between the intentions of the government to provide access to quality ECD for all children and their actual actions in this regard. The policy analysis by Peacock (2022) provides a legal perspective and unpacks the complexity of how policy frames the responsibility of providing learning environments for early childhood development at the various levels of government. The key elements relevant to my research that emerged from the analysis are that the South African Children's Act assigns the responsibility for the establishment of ECD facilities to local government (municipalities). However, other policies, such as the Integrated Development Plan for ECD, do not directly support this responsibility. As seen in the literature, the funding model does not provide funding earmarked for the construction or maintenance of early childhood development centres. A further confusion highlighted is how some functions of oversight and the responsibility of ensuring that these centres meet the norms and standards of health and safety overlap between local and

provincial governments. This overlap causes confusion for both officials and early childhood development providers and is a wasteful duplication of functions. The complication is furthered by the lack of national norms and standards for ECD facilities, as currently the local government establishes by-laws to regulate these facilities while provincial departments follow the norms established by the Children's Act. The literature also does not include the role of local government in this, confirming the blurred lines of responsibility found by Peacock (2022). Pertinent to the argument by Peacock (2022) is the need for law reform, as he states that local government is legislated "to appropriately provide facilities to ensure equitable and universal access to ECD" (p. 305). By formalising the responsibility, funding can be demarcated and allocated for the purpose of establishing ECD centres. The author proposes a ring-fenced fund for the building and upgrading of facilities, rather than the current funding provided per child.

However, returning to the children's rights-based approach, researchers Kernan and Devine (2010) highlight the notion of power in the childhood policy and practice discourse. The authors describe the way that contemporary society asserts control over childhood, as children are "sited, insulated, and distanced, their identities increasingly aligned to pre-specified places, routines, and activities" (Kernan and Devine, 2010, p. 381). This contrasts with the freedom and naturalness inherent in exploration and learning through play that are considered ideal by developmental psychologists (Pramling-Samuelsson and Fleer, 2009). Recent policy development acknowledges the needs, rights, and voice of children and supports the role of play as central to healthy child development. However, the application of the intended developmental support becomes questionable in the domain of early childhood development environments, most notably in terms of varied outdoor play experiences. The literature indicates the inherent focus on performance as the primary aim of pedagogy, impacting the time and space left for play. This rings true in the South African context, where the focus of compulsory early childhood development is on school readiness instead of holistic child development in child-centred learning environments (Rudolph *et al*., 2019). Furthermore, their research indicates that the infrastructure component of the outdoor play areas minimises the notion of an explorative learning environment and the potential for outdoor play. There is therefore a need for processes and participation to be included in the

transformation of early childhood development policies and funding frameworks in South Africa.

2.5 CONCLUSION

The literature review was framed to explore the concepts of early childhood development, responsive learning environments, transformation, and their relationship with policy from a global and local perspective. The research questions that were explored are as follows:

1. What is the relationship between early childhood development transformation and early childhood development learning environments?

2. What is the relationship between the quality of early childhood development and the quality of early childhood development learning environments?

3. What is the status of the early childhood development transformation in post-Apartheid South Africa in the context of local and global development goals?

6. How does the South African policy framework impact the quality of early childhood development learning environments?

The literature affirmed the critical nature of the relationship between people and their environment and how this informs behaviour, both individually and socially. The literature found that the relationship is considered through different theoretical lenses, namely place, perception, and third space. The development of children in relation to their environment is often considered through the ecological systems theory and the environment as a third teacher. The concept of responsiveness was found in the approaches towards the quality and sustainability of the learning environments. The methodology of the pattern language was found to present a possible mechanism for the inclusion of responsiveness and participation in the research and design of learning environments. The theory of social justice emerged as a rights-based approach to early childhood development in a disadvantaged context.

The literature shows a gap relating to research on learning environments and behaviour generally, and specifically on learning environments in South Africa and other African or

developing contexts. Most of the research on learning environments for early childhood development emerges from other disciplines outside of architecture, namely psychology and education. However, there is a body of knowledge in architecture that deals specifically with educational architecture and broadly with environmental and architectural psychology. Again, this literature tends to be rooted within the developed world, originating in Europe, the UK, and the USA, with minimal sources from developing countries and Africa. The application of post-occupancy evaluations and other learning environment evaluations in the context of South Africa is minimal, with no inclusion of established evaluation tools designed for early childhood development.

The framework of Child's Rights and Sustainable Development Goals (SDGs) roots the study within the global understanding of the vulnerable position of children in society, specifically in the developing world. This is extended through SDG 4, which advocates for equality in education and its potential to empower communities. The literature exploring policy and early childhood development learning environments indicates that there are considerable challenges in terms of the quality of early childhood development and its environs. Furthermore, the limited amount of research in the South African context is evident, as I found very few studies that evaluate early childhood development environments. The research considering the policies in South Africa includes references to the conditions of the physical spaces/facilities/infrastructure, with very limited evidence of a deeper understanding of the role of the holistic learning environment as a place, a third teacher, or a third space.

The final section of the literature indicated the potential of participatory processes to develop a guideline towards establishing a framework (standards) that could inform equality in the early childhood development learning environments in South Africa.

3. CHAPTER THREE THEORETICAL FRAMEWORK

3.1 INTRODUCTION

Architecture as a discipline and research field is positioned within the domains of philosophy, social sciences, and engineering sciences. Lucas (2016) defines 'architectural social science' as a response to the role of architecture in providing a context for people according to their needs. He describes 'architectural philosophy' as the way in which we understand the built environment in terms of the meaning of architecture and frames it within the theoretical understanding of spatial experience and the concept of place. Thus, the theoretical exploration in this chapter is situated within the architectural domain but borrows from developmental psychology and critical geography in particular.

The aim of my research is to explore the relationship between responsive learning environments and early childhood development policy transformation in South Africa. The research problem was explored thematically through the review of the literature in Chapter Two, and the review considered the relationship between the environment and behaviour, established the quality in early childhood development learning environments, and explored and examined the relationship between ECD policy and ECD learning environments. I have identified three primary theoretical frames for the research, as illustrated in Fig. 1-11.

The study of the relationship between people and their environment is first and foremost best situated within the paradigm of phenomenology, as it relates to the role of architecture in establishing a connection between a person and her environment (Nesbitt, 1996). I used the lens of phenomenology to examine place theory (Norberg-Schulz, 1980; Carman, 1999; Seamon, 2012) and the concepts of the third teacher (Nicholson, 2005; Hall, 2017) and the third space (Soja, 1996) in relation to learning environments for young children.

The second critical theoretical approach is the use of ecological systems theory (Bronfenbrenner, 1979), which frames the development of children in relation to a multi-scaled environmental system that includes the physical, social, cultural, and political dimensions that a child may be growing up in. The theory is considered through a nested

approach because of its relationship with pattern language (Alexander *et al.*, 1977) and the complexities of the ECD learning environment as an eco-system.

The third framework includes the theoretical lens of social justice (Griffiths, 1998; Munongi and Pillay, 2018) to explore the notion of equality that is imbedded in the rights of children, the sustainable development goals, and the South African policy framework. The spatiality of inequality is further considered through the theory of spatial justice (Soja, 2010) and its relationship to the third space to extend the rights approach within the architectural/environment discipline, bringing together the notion of quality learning environments for all children.

The combined theoretical approach frames the complexity of the relationship between the research concepts of early childhood development, responsive learning environments, and transformation in the context of South Africa.

3.2 PHENOMENOLOGY

Phenomenology can be described as a philosophical inquiry into lived experience (Pink, 2011; Seamon and Gill, 2015). The positioning of my research within the paradigm of phenomenology provides a multi-disciplinary framing of the person/environment exploration to include philosophy, psychology, geography, education, and architecture. The phenomenology conceptualisation of the person/environment relationship allows an intertwined understanding of being-in-the-world rather than the duality of the environment versus people (Seamon, 2012). This relationship is fundamental to developing a theoretical framework for architecture to transform places for children, as it provides a connection between the issues impacting the concept of childhood and the theories relating to childhood development, care, and education. Notably, the role of childhood experiences is a recurring theme within the discourse of phenomenology as part of the inquiry into the nature of our experiences, emphasising how our being is shaped by our world (Heidegger, 1971; Taun, 1977; Norberg-Schulz, 1980; Bachelard, 1994). Furthermore, in the field of developmental

psychology, the work of Piaget and Inhelder (1969); and Winnicott (2005) provides an understanding of children's development of a relationship with their environment.

Critical to an architectural approach through phenomenology is the inherent multiplicity of a whole body's perceptual experience of the environment, as postulated by Pallasmaa (2014). However, the literature indicates that 'place' is individually and socially constructed (Soja, 1989) and includes how children naturally associate with and create their place (Unwin, 2019). Phenomenological framing thus enables architectural design to be rooted in individual and collective experiences rather than merely acting as a functional or sculptural object (Rasmussen, 1959).

This section of the theory chapter will consider the phenomenological framing of the research within the learning environment for young children in the context of South Africa by exploring the concepts of place, the third teacher, and the third space in relation to early childhood development learning environments, as illustrated in Fig. 3-1.

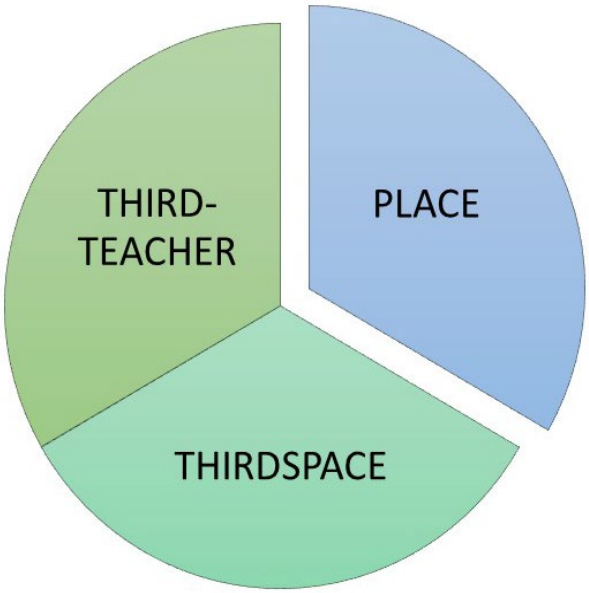

Figure 3-1 Conceptual Framework of Phenomenology

Source: Author (2023)

3.2.1 PLACE

The theory of place explores the relationship between people and physical environments and how a person finds attachment to a specific space through physical and psychological relatedness. Critical to the understanding of place is perceptual theory, which explains the way people perceive their environment or phenomena. Through perception, the physical characteristics of the environment in terms of materials, volume, scale, light, warmth, enclosure, and more work together to construct the potential whole-body sensory experiences of place. The 'whole body' refers to the multi-sensory aspects of sound, touch, smell, taste, movement, and sight. However, Pallasmaa (2005) critiques the pragmatic and visually focused approaches to architecture to consider the potential of a multi-sensory environment to provide a much richer experience and potentiality of place.

The search for a meaningful relationship between people and their environment that emerged towards the end of the modernist period can be traced to the phenomenological explorations of Relph (1976); Taun (1977); and Norberg-Schulz (1980), among others. The predominant focus on functional efficiency through mass production and increased urbanisation in the developed world was criticised as becoming meaningless and leading to place-lessness. The production of functionally and cost-effectively driven learning environments, consisting of rows of classrooms, that are predominant in developing countries and in South Africa, is rooted in this mass production mode of thinking. Within the architectural discourse, Norberg-Schulz (1985) postulates that by incorporating the concepts of 'place' and of 'dwelling', the physical environment serves to develop a sense of place by allowing a person to establish an existential foothold or understanding of 'being-in-the-world'. The notion of a sense of place is a recurring theme within environmental psychology (Steg *et al.*, 2013), learning environment research (Lippman, 2010a; Matthews and Lippman, 2020), specifically related to younger children, and stressing the importance of belonging (Day and Midbjer, 2007; Sussman and Gillman, 2007).

However, place is easily understood but somewhat difficult to define. Literature indicates that the different philosophical perspectives consider place as a determinant of human action, possible only through people's ecological actions, and that the impact of people on a place is existential (Seamon, 2012). From an environmental psychology view, the three main domains

of place attachment can be identified to include the existential consideration of the meaning or significance of a place, psychometrics, which looks more at how attachment to a place influences the psyche, and socio-constructivism, which considers the role of people in creating a place through social action (Morgan, 2010). These different approaches are not mutually exclusive and can be seen to provide layers of complexity when defining and understanding the people-environment relationship. Considering my focus on young children who are at the height of their perceptual experience of their development, combined with the architectural nature of my research, the phenomenological approach is valid as an appropriate framing tool.

Through phenomenology, place can be defined as a space with meaning, where the meaning is derived from the unique character or quality of the space. Critical to this definition is how meaning develops from the experiences of people. The meaning developed is not universal but rather individual or collective in social relations. This phenomenological approach is rooted in the notion of belonging or dwelling, which describes how we find meaning in the environment (Heidegger, 1962). Furthermore, the definition of place suggests that the sense of belonging allows people to orientate themselves within and identify themselves with a space, when experiencing the environment as meaningful. Using this conception of place, experience requires more than just the meeting of functional needs. Norberg-Schulz (1980) argues that the spaces where life occurs are places and considers a place to have a distinct character.

However, critical to the understanding of place is the role of the body in human experiences (Merleau-Ponty, 2002). The shift from existentialism (Heidegger, 1962) to perception enabled a more holistic understanding of experiences where body and mind are not separated (Seamon, 2012). The holistic view of a multi-sensory bodily experience provides an existential understanding of the people-environment relationship as one of both interaction and interdependence (Seamon, 2000; Pallasmaa, 2005). Critical to this perceptual view is the simultaneous interaction of the senses to establish connectedness to place. Furthermore, the role of the body is central to experience, as it is the container of perception, thought (emotion), and consciousness (Pallasmaa, 2005). However, researchers agree on the inherent unconscious nature of experiencing place due to the interwoven relationship of our being-in-the-world (Merleau-Ponty, 2002; Menin, 2003; Pallasmaa, 2005; Seamon, 2013). This

unconscious nature of sensing is defined as intimate sensing that requires contact (although it should be recognised as more than just touch) (Gibson, 1986).

Moving the discourse to the relationship between children and their environment, there are marked differences between their relationships and those of adults. The way adults see their environment as having a predefined purpose stands in contrast to how children see their environment in terms of opportunity. The differences become pronounced through scale, navigation, affordances, and emotions, which determine both differences in experiences and meanings. Furthermore, in the world of a child, the environment is personified as a character to be met and engaged with (Day and Midbjer, 2007). Although the differences can be attributed to the physical size of a young child and their cognitive and emotional development, the most pronounced difference can be ascribed to their heightened sensory perception (Morgan, 2010) .

The complexity of perceptual processes is determined by a complex sensory system (Gibson, 1986) that works with the sensory organs of sight, hearing, taste, and smell:

- The haptic sensory system, which provides touch as well as our awareness of texture, surfaces, contour, temperature, humidity, pressure, pain, and visceral sense.
- The kinaesthetic sense works through our muscles, skeleton, and joints to perceive our positioning, solidity, and the resistance of surfaces.
- The vestibular system allows us to feel body movement such as climbing and descending, turning and twisting, and moving freely between or around obstructions.

Thus, the sensory systems allow full engagement between the whole body and the environment during the perception of place. Considering the complexity and engaging sensory process, the critical role of the child's body as central becomes evident (Piaget and Inhelder, 1969). The unconsciousness of what the whole body experiences is further elaborated on by Pallasmaa (2005), when referring to the relationship between sensory processes, sensory responses, and thought to define this as 'peripheral vision'. This notion is best explained as unconscious vision, anchoring people to their broader context. Thus, peripheral awareness confirms the positioning of the immediate place within a distinct setting. By contrast,

Pallasmaa (2005) describes a focused vision as a more confrontational or immediate form of contact.

However, the process of growth and development from infancy through the toddler stage to pre-school adds a further layer to the complexity of the place experience. The key aspects to consider include scale, mobility, ability, and sensory differences. In particular, the developing sensory organs require consideration of the sensitivity to light and sound of babies when compared to the pre-school child. Furthermore, the duality of dependence and independence manifests in how their relationship with their environment moves between nurturing and exploration (Day and Midbjer, 2007). The younger a child, the more nurturing and limited stimulation from light and sound is appropriate. During the process of development, as children become more independent and more attuned to sensory stimuli, their environment can include more intensity of light, sound, texture, and colour and enable more exploration. The relatedness of a child's growth aligns with the notion that the place is defined as the centre while the body is the moving point of reference (Menin, 2003). However, this centrality of the person or child over their environment affirms how the physical enables the meaning of place to be constructed.

In contrast, geographers (Tuan, 1977) consider the concept of place as being in opposition to space, where the former denotes constraint and safety and the latter relates to freedom. Tuan's approach to place overlaps with bodily experiences, leading from space to becoming place. The notion of meaning that develops over time within a place is emphasised. However, the most valuable of his arguments relates to the relatedness of people and place. Tuan (1977) argues that place is directly connected to people, referring to the loss of meaning once the human connection is removed. This particular humanistic/social approach differentiates his arguments from others in the geography discipline and also from the architectural approaches in the preceding section. However, the related concepts of place (belonging) and space (freedom) postulated provide a way of understanding the contrasting requirements of early childhood development learning environments (Tuan, 1977). On the one hand, places for children are defined by their protective, secure quality that allows a child to be (in the world). In contrast, the explorative nature of holistic child development requires a sense of freedom that enables holistic exploration (Kernan and Devine, 2010).

A further layer of complexity to understanding the potential of place is presented by cultural differences in the way that people experience place, as these have been recognised to determine preferences and place attachment. The investigation by Rainisio and Inghilleri (2013) of the relationship between culture and its interrelation with nature recognises differences in people's interpretive modes in different cultures. These differences are embedded in the complex relationship between cultural, cognitive, and genetic factors that determine place experience, therefore emphasising the role of context (social and physical). In my research, the lens of place is applied to the unique context of the early learning environment and adds a further layer of complexity through pedagogy that leads us to the concept of the third teacher.

3.2.2 THE THIRD TEACHER

The understanding of architecture as a silent language presented by Unwin (2019) provides a phenomenological underpinning for the concept of the third teacher and extends the exploration of place for children. Unwin (2019) views architecture as being in the world and considers how verbal communication can be controlled (silent), while in contrast, it is not possible to 'not be somewhere' – meaning that people are always interacting with their physical environment. Day and Midbjer (2007); and Hertzberger (2005) stress the critical role of architecture as it influences everybody, and more so children. Thus, in the learning environment discourse, the third teacher conceptualises the potential of the physical environment to work in concert with the educator and parent to become an extension of the pedagogy through silent lessons. However, it is critical to recognise how the silent messages extend to more than just pedagogy in terms of the underlying value of education and the positioning of children in society (Nicholson, 2005).

The third teacher is viewed through two possible lenses: firstly, in relation to the didactic nature of providing appropriate affordances (Dudek, 1996; Berris and Miller, 2011; Močinić and Feresin, 2017; van Liempd, Oudgenoeg–Paz and Leseman, 2019), and secondly, through the potential of co-construction to give a voice to children as participants in the pedagogic process (Gallacher and Gallagher, 2008; Robson and Mastrangelo, 2018; Jobb, 2019; Cortés Loyola, Adlerstein Grimberg and Bravo Colomer, 2020). The notion of the voice is explored in participatory design and research approaches that include children, parents, and educators

(Clark, 2007; 2010a; Hall, 2017; Miller, 2017; Merewether, 2018), and both lenses of didactic teaching (Sotuku *et al*., 2016) and co-construction (Dirks and Roy, 2022; Lunga, Esterhuizen and Koen, 2022) are explored in the emerging learning environment and early childhood development literature from South Africa.

The concept of the third teacher is rooted in the constructivist approach to learning, which proclaims that the innate curiosity of children leads to learning through action, and this is extended into the co-construction of research and design through participatory processes. Throughout literature relating to the third teacher, reference is made to the Reggio Emilia approach, a pre-school system that originated in Italy. It is attributed to Loris Malaguzzi, and includes spatiality as an integral part of pedagogy (Cortés Loyola *et al.*, 2020). Nicholson (2005) adds that explorative learning recognises how young children learn through their whole-body perceptual experiences, and these provide the potential for a place to have meaning and attachment. This supports holistic child development.

When examining the historic account of the first Reggio pre-school, we can trace the inherent social spatial nature of the co-construction, which includes both the pedagogy of active learning and the making of the physical environment that developed through community engagement (OWP/P Architects *et al*., 2010). One of the key features of Reggio Emilia's physical spaces is a collective creative space called an atelier (studio), which is shared by different classes and enables social co-construction across age groups (Day and Midbjer, 2007; Cortés Loyola *et al*., 2020). This space usually forms a connection to the outdoor play area, emphasising the value and inherent third teacher qualities of the outdoors (Merewether, 2019). The importance of the collective space as part of the pedagogy underscores that the active learning approach is established by the physical environment being intertwined with the social environment. This notion of the social experience of a place points to the third concept in my framing of the ECD learning environment, which considers the third space.

3.2.3 THE THIRD SPACE

As discussed earlier, drawing from the humanistic geography of Tuan (1977), the concept of the third space considers the differences between actual space and lived space. The concept of the third space, coined by Soja (1996), relates to the theory of the third space that is

attributed to the post-colonial theorist Homi Bhabha (1994) in his seminal work, *The Location of Culture*. His theory presents a postmodernist argument that recognises the hybridity and fluidity of identity. Rooted in the socio-cultural tradition in psychology, i.e., constructivism (Mooney, 2013), the theory recognises the role of the socio-cultural environment and its relationship to people and spaces. Bhabha's (1994) approach focuses particularly on colonialism and the relationships between the oppressed and the oppressor, as found between the colony and the coloniser. However, the theory finds further application in breaking and connecting binaries, and thus has a different interpretation in various disciplines. From a geographical or architectural perspective, the theory of third space considers the three dimensions of space, where two potentially opposing spaces are mediated by the in-between of the socio-cultural realm. For example, home is the 'first space' and school is the 'second space'. The third space represents the in-between or hybrid space of negotiating individual, collective, cultural, and social boundaries. In education, the third space theory provides the framework to consider the social or cultural dimension in relation to pedagogy and the curriculum and most often negotiates the relationship between the home and the institution (Silver, 1988; Jensen, 2015; Ferreira *et al.*, 2018).

However, the conceptualisation of the Third Space by Soja (1989, 1996) extends into the critical spatial thinking of Foucault (1994) and Lefebvre (1991) to consider the relationship between society and space. The third space is directly rooted in Foucault's notion of heterotopia, which articulates the multiplicity, layered complexity, and meaning embodied within a place. The argument by Lefebvre (1991) considers the production of space to frame our environment as physical, imagined, and social, arguing that a space is a social construction that provides the basis for understanding the intangible dimensions of the space and its connectedness to the social milieu. Thus, Soja's (1989, 1996) concept of the third space is a geographical framework for the analysis of the relationship between people and their physical (urban) environments. Furthering the spatial triad described by Lefevre and Bhabha, Soja defines the third space as the social production of a space that consists of a perceived space (the first space) and a conceived space (the second space) to capture the lived space (the third space). It provides a framework to disentangle the physical and social dimensions of spatiality, as elaborated below (Soja, 1989; Ferreira *et al.*, 2018; Berti *et al.*, 2019):

- The first space (perceived) is the real space that can be measured and mapped. This refers to buildings as the physical things that people experience.
- The second space (conceived) considers the mental image or imagined representational space. This refers to how the space has personal meaning, is perceived by outsiders, or is represented in policies and reports.
- The third space (lived) combines the first and second spaces to explore the meaning of a space through the interaction between people and the space. It is referred to as the lived space and how the inhabitants mould and shape their surroundings, including the cultural and social influences of the individual experience.

A related theoretical stance by Massey (2005) considers the multiplicity of space, place, body, and perception as the unknown or 'chance of space' phenomena developed by daily experiences. In the phenomenological exploration of my research, the inclusion of perception and experience is critical, as it enables the comprehensive framing of ECD learning environments to include the place, the third teacher, and the third space. In learning environment research, the applications of the third space have varied positions, including entanglement (Hackett, Procter and Kummerfeld, 2018), voice and power relationships (Ferreira *et al.*, 2018; Jobb, 2019), and children's spatiality in multi-cultural settings *(*Cortés Loyola *et al*., 2020).

Furthermore, Ferguson and Kuby's (2015) application of critical spatiality in the ECD setting applies a non-linear research process where the concept of the first, second, and third spaces (Soja, 1996) connects the researcher with pedagogy and children's space. Notably, the third space is a tool with which to examine research data to gain a deeper understanding of the complexity of the ECD space. In parallel, using the critical spatial lens, Hackett *et al.* (2018) refer to the concept of 'chance' as an alternative to the notion of quality when considering children's environments. Their argument acknowledges entanglement as an abstract of the interconnected relationship between people, things, and places. However, the third space could potentially disrupt the transformation of the understanding of childhood experiences, specifically the role of space in supporting diversity, as "it challenges an established policy context which positions children as 'becomings' rather than 'beings'" (Hackett, Procter and Seymour, 2015, p. 1).

Considering power and the positioning of childhood, Jobb (2019) proposes the potential of the place as a mediator between the often polarising approaches of child-centred and teacher-centred pedagogies. This positioning is furthered through the lenses of entangled space and perceived place (Tuan, 1977; Massey, 2005) towards co-construction and meaning in pedagogic ECD learning environments (the third teacher). The positioning of children as active participants in learning and space is critical to the third space conceptualisation of ECD learning environments (Ferreira *et al.*, 2018). However, when including ecological systems theory (Bronfenbrenner, 1979), the production of space through social learning includes a process of meaning-making through a multi-layered construction of the micro-context to include different subjectivities, relationships, and practices. The relationships in the co-construction extend to the meso and macro level contextual influences of the community, the culture, and the urban or rural setting. Furthermore, the micro-context of the ECD learning environment establishes the school culture, which encompasses the children, the teachers, and the space through everyday activities (Ferreira *et al.*, 2018).

3.3 ECOLOGICAL SYSTEMS THEORY

The exploration of the interrelatedness between the development of children and their context is best understood through the ecological systems theory developed by Uri Bronfenbrenner in his book, *The Ecology of Human Development* (Bronfenbrenner, 1979). The theory was developed using a system thinking approach to child development, where the interrelatedness of parts to the whole and various systems at various scales provide the framework for the ecological development model. The framework considers a context as an ecology consisting of physical, social, and cultural realms. Critical to the theory is the interrelated nature of the relationship between the system and the developing child. Bronfenbrenner (1979) argues that "the developing person is viewed not merely as a tabula rasa on which the environment makes its impact, but as a growing, dynamic entity that progressively moves into and restructures the milieu in which it resides" (p. 21). Thus, the development process is recognised to be two-directional between the child and their context (Ferguson *et al.* 2013). The active participation of the child/person in the ecosystem is rooted in the socio-constructivist development theory of Vygotsky (Langford, 2005). The notion of an

ecosystem (socio and physical) further supports the argument presented in the third space theory (Bhabha, 1994) and the conceptualisation of the third space (Soja, 1989; 1996).

In this section, the theoretical framing of my research will be grounded in the original nested system of Bronfenbrenner (1979), the interconnected nature of the systems in relation to the pattern language (Alexander *et al.*, 1977), and the system to explore the complexity of the ECD learning environment to position children and educators as central to their ecosystem.

3.3.1 A NESTED SYSTEM OF THE SCALES OF CONTEXT

The ecological model is understood to represent a range of scales or layers of context that act as an interwoven system of influence. Bronfenbrenner (1979) describes the model as a nested system comparable to Russian dolls. It works from the immediate microsystem and through the surrounding mesosystem (system of micro contexts) towards a system where the child is not actively present but is still impacted. The exosystem considers the interactions between the systems, and the macrosystem, at the broadest level, and represents the given societal contexts (Bronfenbrenner, 1979). The later addition of a further layer describes the chronosystem, which encompasses time and includes the transitions or changes that may impact all of the other systems (Berk, 2013). The multiple layers of the system are recognised as an ecology, where the characteristics or variations of a layer impact the other layers (as defined in natural systems). The interaction between the contexts (systems) is as relevant as the interaction that the child experiences every day with her immediate microsystem (Bechtel and Churchman, 2002; Berk, 2013).

At the heart of the model, the microsystem represents the child's immediate contexts, which include the home, preschool, and community. These contexts are represented by both the people they engage with on a daily basis and the physical spaces that they inhabit throughout their days (Bronfenbrenner, 1979; Berk, 2013). For many children, the ECD learning environment comprises a core context for them, as they spend a large proportion of their waking hours in this setting. A further context could be their church or other religious system that forms part of their lives. Notably, the home and the school setting can each be seen as separate micro-systems, while the classroom represents a distinct micro-system (Stankovic-Ramirez and Vittrup, 2023). Using the phenomenological lens, the intensity of the engagement

within these micro-systems can confirm the critical nature of the impact on children. Furthermore, the significance of the quality characteristics is confirmed in the learning environment. Here, we include the sense of belonging through place, the environment as the third teacher, and the potential for a third space to enable a reciprocal interaction between the child and the environment, as discussed in Section 3.2.

The mesosystem represents the interaction and connectedness between the different contexts of each micro-system (Bronfenbrenner, 1979; Berk, 2013). For children attending an ECD centre, this refers to the interactions between their home and the preschool, their classroom, and their outdoor play area, as well as the spaces in between (Silver, 1988). Another context for children from a disadvantaged background could be the taxi rank and taxi that they use daily. Or similarly, the road that they walk in their neighbourhood to get to school. In the context of South Africa and other developing countries, the contrast between the home and learning environments can be so distinct as to represent completely different worlds (Engle *et al.*, 2007; Aldridge *et al.*, 2018; Boyden *et al.*, 2019b). Given the holistic nature of the systems model, these contexts are represented by both people (social interactions) and places.

The exo-system considers the indirect influence of other ecosystems on a child's life (Bronfenbrenner, 1979; Berk, 2013). From an architectural perspective, we consider the urban or rural setting that a child is growing up in as relevant. However, the influence could be broader to consider the local authority's bylaws and how these impact the ECD centre. At a broader level, the macrosystem in the framework is the outmost layer, as it is the most removed from direct contact with the child (Bronfenbrenner, 1979; Berk, 2013). However, the macrosystems of culture, religion, and the socio-economic status of the child and their family might seem removed but could have a very direct impact in terms of how these systems are expressed in the microsystems. These broad systems impact beliefs and policies, which impact and govern society in different ways depending on their specific settings. Significant to these macrosystems is how the societal values embedded in culture and policies determine the positioning of children. As discussed in the preceding sections, the positioning of children becomes a key determinant of the quality of the environments that they grow up in (Jobb, 2019). Due to the overarching nature of these macrosystems, their influence tends to work its

way through each of the other layers to impact directly on the developing child (Pence and Shafer, 2006; Pillay, 2018).

However, the more recent addition of the chronosystem (Berk, 2013) as a further outer layer brings the dimensions of time and change into the ecological model. These may include a change at the micro-level in the immediate family through to broader influences at the macro level, such as natural disasters or the recent COVID-19 pandemic. The chronosystems are cross-cutting in their impact and can often not be determined until later in children's lives. For example, the recent COVID-19 pandemic has had visible influences on all scales of the system, but the lasting impacts on child development are yet to be established (Koen *et al.*, 2021; González *et al.*, 2022).

The strength of the theoretical model seems to be in the simplicity of the framework with which the complex nature of environmental influences on children can be explored and understood. It is, however, critical to include how each child may experience the same system(s) in different environments, as was established in the original research by Bronfenbrenner (1979), which found differences between siblings in the same environments. More recent research extends the original model to consider the impact of globalisation on local systems in terms of contextualised understandings (Holloway and Valentine, 2000; Korpela, 2002; Ferguson *et al.*, 2013). However, the simplicity and nested structuring of the system provide an outsider's (adult) perspective on the complexity of child environments. The systems model is therefore not aligned with children's rights and has limited understanding of the ECD programme's development through children's experiences.

3.3.2 INTERCONNECTED SYSTEMS OF PATTERNS

In my review of the learning environment literature, the relevance and application of *The Pattern Language* (Alexander *et al.*, 1977) (Section 2.3.3) are discussed as a methodology towards a research-based design guideline. However, critical to *The Pattern Language* is its systems approach to recognising the interrelatedness of different patterns across a range of scales, from the macro scale of the city or region through to the micro-scale of a seating space. The interconnectedness of the patterns is what enables the formation of a language.

Furthermore, the approach is rooted in an understanding of the relationship between people and their environment, with a tendency towards favouring solutions that are based on people's experiences (Seamon and Mugerauer, 1985) and thus finds suitable application in the development of responsive environments. This section will therefore consider the alignment between the ecological systems theory that is focused on child development and the theoretical basis of the pattern language that supports architectural and urban design through everyday experiences.

At the outset, we can recognise the inherent third space nature of pattern language as a more human-centric approach to design that is achieved through a research approach that includes studying how everyday people engage with and construct their place. Furthermore, one of the aims of the source book is the ownership of design by everyday people as they shape their own environments (Ortola *et al.*, n. d.). However, the parallels between the pattern language of Alexander *et al.* (1977) and the ecological systems model of Bronfenbrenner (1979) are found in their rooting in general systems theory (Berk, 2013; Dawes and Ostwald, 2017).

The systems approach in both includes scaling of the contexts that shape our environment. In pattern language, there are three scales: town, building, and construction. Each represents a different scale of system(s), which are comparable to the macro (town) and micro scales (building) of the ecological model. However, a more detailed investigation of pattern language indicates that the patterns within these scales are further grouped to represent multiple systems, and each pattern could be considered as a tool to understand or design a system (Ortola *et al.*, n.d.). The way that the patterns are presented to enable combination and relationships furthers the systems approach and could be comparable to the meso and exosystems.

However, the theoretical underpinning of pattern language also includes the notions of timelessness and place, which relate to how our environments emulate meaning. The notion of language enables connectedness to form sentences, and each pattern is simply connected to the next with a singular meaning (Alexander *et al.*, 1977). This underlying language provides a strong relationship with the conceptual third teacher when applied to learning environments. From a conceptual perspective, the pattern language also affirms the

complexity inherent in the people-environment relationship and provides the potential for co-construction.

3.3.3 COMPLEXITY OF THE RESPONSIVE LEARNING ENVIRONMENT ECOSYSTEM

Due to the rights-based nature of my research, it is critical to question the original outsider's perspective of the nested system to find the potential for refocusing the model to explore the complexity of a responsive learning environment where children and their educators can be positioned as central to their ecosystem. In support of my argument, Edwards (2005) postulates that the classroom is a microcosm of the world. In a related argument, Hertzberger (2008) establishes the school as a microcity, noting how learning environments compact the same complexities as those found in a city. In contrast, some research considers the ECD classroom as a mere microsystem (Lippman, 2010b; Stankovic-Ramirez and Vittrup, 2023), with the teacher positioned to shape the environment.

However, Ferguson *et al.* (2013), recognising the multiplicity inherent in the impact of the physical environment on ECD, propose a biocultural framework that includes the ecological systems model with more recent approaches to ecocultural and biocultural co-constructivist paradigms in an attempt to develop a framework that can be applied across multiple contexts. Their research includes a three-phased approach:

- Identifying influences (direct and tangible, like noise, crowding, and chaos).
- Using a proximal process to find interactions between children and their environments the home, school, and neighbourhood are identified, and the influences identified in each system are considered.
- Finding inequality and opportunities in an international study setting with its limitations identified and using them as the potential for change in dealing with influences through interventions.

Furthermore, their research emphasises the limitations of the ecological systems model in terms of the complexities found across different contexts, which may include vulnerable communities, and stresses the need for interdisciplinary and participatory approaches to

establish a better understanding of the impact of environments on children and adolescents (Ferguson *et al.*, 2013).

In evaluating the original modelling of the ecological systems theory, it is evident how the outsider's objective view observes the context of the child and their microenvironment as a small circle at the centre of the larger meso, exo, and macrosystems or environments. However, my approach is to view the ecology of early childhood development through the phenomenological lens of embodied place, with the potential for spatial justice and the social construction of their environment, as defined in the third space. This approach requires the deconstruction and reconstruction of the ecological systems model to consider the microenvironment as representative of the whole world of children. From the perspective of the child and, to some extent, the women working in the ECD centres, the microenvironment is their primary system. All other systems and contexts become peripheral, turning the model inside out. Fig. 3-3-2 illustrates this adapted modelling, where the ecology of the microenvironment is central to the system.

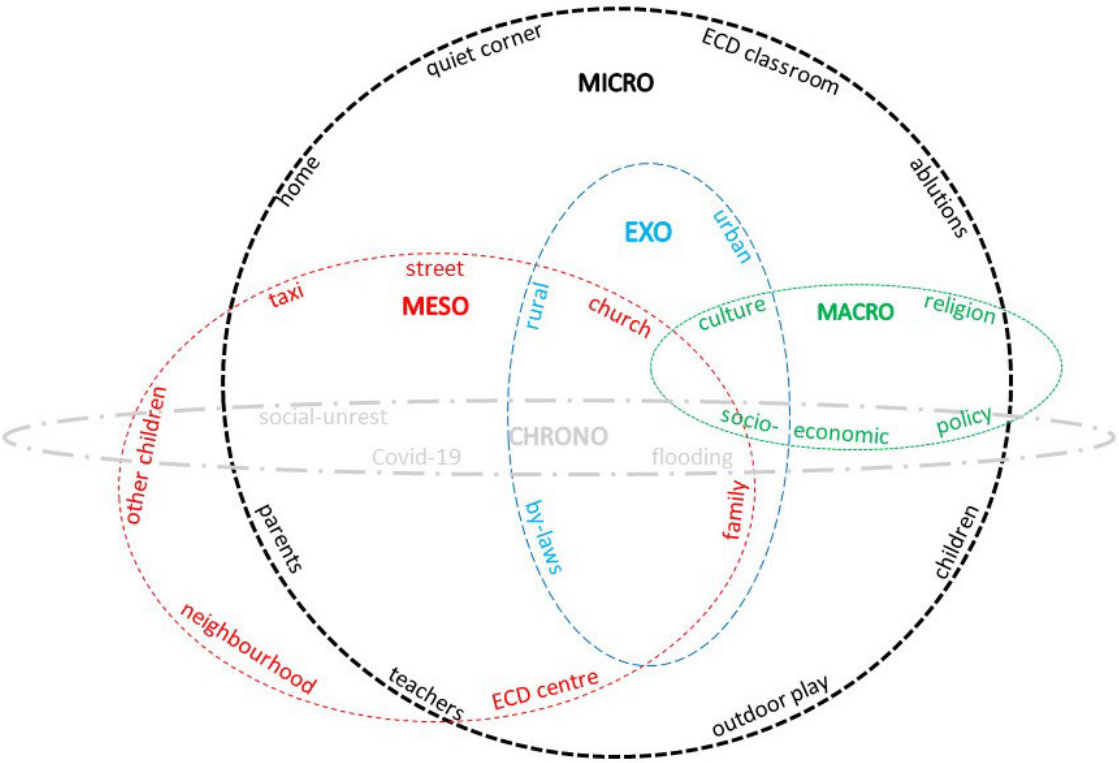

Figure 3-2 Ecological Systems Model from the Perspective of ECD

Source: Adapted from Bronfenbrenner (1979) by Author (2024)

My proposed reconceptualisation of the ecological systems model contrasts with the rights-based research by Pillay (2018), who considers orphaned and vulnerable children's experiences and applies the ecological systems model as an analytical model. Similarly, Chinyoka and Kuakunesu (2017) use the original model to explore the implications of poverty on the ECD in Zimbabwe, which is a context with very similar challenges to South Africa. However, O'Keeffe *et al*. (2022) developed a framework with the added complexity of the influencing systems to investigate the quality of the ECD. The framework adds to the depth of engagement required to explore the quality of the ECD in a context such as South Africa, but it still reads as the original outsider's view of the ecological model. Notably, Aina and Bipath (2022), although not following the ecological systems model, developed an approach to look at the systems required to support ECD that accentuates the complexity of the influences on quality. Pertinent in their argument is the value of support systems outside the ECD learning environment's microsystem, which acknowledges the existence of ecological modelling. I have noted that these frameworks are all fairly recent, which indicates the relevance of the ecological systems model in my study. The reconceptualisation of the model is in line with the positioning of children within the rights-based paradigm (Mertens, 2007), especially in contexts where equality between children is still limited.

3.4 SEEKING SPATIAL JUSTICE FOR ECD

The rights-based approach of the research is ideally situated within the lens of justice. The inherent inequalities of ECD in the context of South Africa are well documented and of such magnitude that they are identified as forms of discrimination. In particular, the inequality viewed through a spatial lens includes limited access to learning environments that support quality ECD. Along with the rights-based approach, the UN's SDGs have been developed as a global mechanism with which to address inequality across many spheres, but particularly those that impact children, their education, and the environments that support their development.

In architectural research and design practices, justice has been extended through participation and collaboration (Mäkelä and Helfenstein, 2016; Greenall, Wong and Toohey, 2023). These approaches align with the socio-constructivist understanding of the relationship between people and their environment, as explored in Section 3.2.3, using the concept of the third

space. Furthermore, the pattern language of Alexander *et al.* (1977) explored in Section 3.3.2 is rooted in the development of a design based on lived experiences. Noteworthy is the fact that user-defined architectural design and participatory processes stand in contrast to the top-down approaches that originated in the modernist era. Thus, the lens of social and spatial justice positions my research within the broader debate of the role architecture plays in serving society and positioning the architectural professional as a social agent.

In this section, the theoretical framing of my research will first be grounded in the theoretical framing of social justice (Griffiths, 1998; Munongi and Pillay, 2018), and secondly, the layer of the spatiality of injustice will be framed using the theoretical framing of spatial justice (Soja, 2010; Kabinirinassab, 2017). These theories provide an appropriate lens to understand the inequalities of the learning environments in ECD in the search for a mechanism for transformation.

3.4.1 SOCIAL JUSTICE

The theoretical framing of social justice is rooted in a drive towards equality for all people, regardless of individual or group differences (Shirazi and Keivani, 2019). The intention of a socially just society is, above all, to ensure that those who are more vulnerable are not discriminated against. As discussed in Chapter Two, Section 2.4, the positioning of children globally as well as in South Africa has moved them from the periphery to a central government concern. However, despite the development and implementation of policies to advance social justice, in line with children's rights and the SDG's, the inequalities of the disadvantaged and other vulnerable children persist (Shirazi and Keivani, 2019; Sustainable Development Solutions Network [SDSN], 2020). It is critical to note that the pursuit of social justice depends on policy and programme responses from international organisations and local governments to optimise early childhood development. The research reported in Chapter Two indicates that the intentions of the South African government to provide equal access to quality ECD that is based on children's rights and social justice have not been realised. Furthermore, the review of literature indicates the inclusion of the theoretical lens of social justice towards the support of equality in various disciplines related to this research, namely environmental psychology (Bechtel and Churchman, 2002), education (Robinson and Jones-Diaz, 2006; Ziemes and Gutzwiller-Helfenfinger, 2019), early childhood development (UN Committee on Rights of the

Child, Unicef and Bernard van Leer Foundation, 2006), learning environment research (Clark, 2010b), research methodology (Griffiths, 1998; Mertens, 2007), and geography (Soja, 1989), among others.

Thus, the framing of my research, which deals with the limitations to the quality of the ECD in South Africa, requires the further theoretical lens of social justice, which, in principle, aims to impact the causes of inequality to initiate change that could bring lasting transformation (Hard, Press and Gibson, 2013). However, doing research for social justice raises various questions relating to the political and ethical positioning of researchers that lead to biases or underlying assumptions (Griffiths, 1998; Mertens, 2007). It is therefore pertinent to establish how my research is positioned and how it became evident that the theoretical framing emerged from the literature and the engagement with the case study and participants. Considering that my research title includes the term 'transformation', there is already an acknowledgement that change is required. The title was developed in relation to the research problem, the literature, and the fieldwork, which identified that the provision of ECD in South Africa is not equal for all children. The focus on social justice is not a primary aim of the research project; rather, it is applied as an analytical lens to ensure that the principles of children's rights can form part of the exploration and findings (to be furthered in the research methodology of Chapter Four).

Application of the lens of social justice argues for a paradigm shift from considering what children need to what their rights are (Pillay, 2014; 2018). Inherent in the needs-based approach is the positioning of children and other vulnerable groups as being voiceless, where experts make decisions for them. It is this inherent limitation in giving a voice to certain groups (based on gender, age, race, class, disability, etc.) that initiated the various social justice actions that led to the implementation of the rights movement. The positioning of these vulnerable groups within the social justice framework moves to include their voice in the decisions that affect their livelihoods and provide potential equality. Therefore, the issue of power is inherent to the social justice discourse as it impacts policy, practice, and research (Mertens, 2007).

According to Pillay (2014), the definition of children's rights often depends on the discipline that views them. However, three overarching categories of rights can be found across these

domains, namely: provision, protection, and participation. Notably, all three of these domains should be included in quality early childhood development and learning environments. Following on from the phenomenological concepts explored in Section 3.2, each can be aligned with the categories of rights to include: provision (third teacher), protection (place), and participation (third space). Although this alignment may seem overly simplistic, it has validity as a framework, as one of the critical concerns noted in relation to ECD learning environments is the severe limitations on quality, especially in disadvantaged communities. Noting the devastating impact of poverty and poor-quality environments that children are exposed to is the starting point in establishing their needs.

However, it is evident in the literature that a social justice framework is inherent in the more recent learning environment research (Barrett *et al.*, 2019; Matthews and Lippman, 2020) and architectural design approaches (Clark, 2010a; Lippman, 2010b; Mäkelä and Helfenstein, 2016), and that it includes the participation (that gives a voice) of various stakeholders, including children. From an architectural perspective, the general focus of participation and engagement with users is rooted in establishing the unique requirements and needs of end users. This approach to the co-construction of knowledge and environments requires the furthering of the spatial justice framework to include the critical spatiality inherent in the third space (Soja, 1996) to achieve spatial justice (Soja, 2010).

3.4.2 SPATIAL JUSTICE

Tracing the roots of critical spatiality in geography, Lefebvre's seminal work (Lefebvre, 1991) considers that every individual has a right to the city. Soja (2010) argues that cities provide individuals with opportunities and service their basic needs for accommodation, education, and development. The critical conceptualisation of space acknowledges the interrelatedness between people and space, as was discussed about the third space. At the core of the third space concept is the notion of space as a social product related to people's daily activities (Soja, 1989; Lefebvre, 1991). Therefore, the control of this social production of space is redirected towards affected people, including children (Mahmoud and Elrahman, 2014). In urban studies, the concept of rights to the city extends this spatiality to advocate for the rights of marginalised communities through social action (Soja, 2010). My argument is that the notion of the right to space can therefore be applied to learning environments through the

lens of spatial justice and as an extension of the social justice agenda through participatory processes (Greenall *et al*., 2023).

The relationship between children and their environment, justice, and rights seems to be a multi-disciplinary effort that includes geographers, environmental psychologists, socialists, urbanists, and architects. Cele (2008) comments on the lack of a theoretical stance by environmental psychologists, who aim to improve spaces for children by knowing how children understand and experience space and advocating for their participation in making their environments together with children's rights activists. However, the conceptual understanding of childhood and the position of children in the world is directly related to how children's spaces are constructed (Bollig and Millei, 2018). Considering this embedded space and its relationship with childhood, it underscores the need for social and spatial justice for children and for their care and holistic development to be connected to their spaces or environments. Bollig and Millei (2018) refer to the original kindergarten that was ideated by Fredrich Froebel as a space in nature, allowing interaction with nature and a place to grow, independent of societal demands. However, this idealistic kindergarten or ECD service concept has rarely been achieved. Within this construct of children's space as a position of childhood, the institutionalisation of ECD can be seen as regulation and control rather than as a space for freedom, as was intended. However, through pedagogic approaches based on child-directed play and learning and recent developments in research and practice lending a voice and agency to children, the potential of the original kindergarten may yet be found as a form of spatial justice for children (Bollig and Millei, 2018; Jobb, 2019).

In the context of South Africa and this research, the need for spatial justice relates more to the right to the city and how this approach addresses the inequalities in spatial terms. In my exploration of the status of ECD in South Africa, the research confirms the range of challenges that are limiting equal access to quality ECD. The poor quality of the ECD infrastructure was highlighted by all the research reports as a major concern that is the direct result of a gap in the policy framework to acknowledge the value of quality ECD learning environments (Ashley-Cooper *et al.*, 2019; Madyibi and Bayat, 2021; Atmore, 2023). Furthermore, challenges to the quality of learning environments, specifically in disadvantaged communities, lead to increasing inequality (Ashley-Cooper *et al.*, 2019), which is in direct contrast to the rights-based

intentions of the South African policy framework to provide equal access to quality ECD. Notably, Fredman *et al*. (2022) extended the limitation in the rights-based legal framework to identify poor infrastructure and limited quality in disadvantaged communities as discrimination.

The spatial justice lens is rooted in constructivism and is supported by the concept of the third space to bring together the issues of inequality as discussed regarding social justice inclusive of the people-environment discourse. In this research, spatial justice includes the positioning of children in their classrooms to support the notion of ownership (it being their space), which should provide a sense of place. Furthermore, the position of the educators and centre managers/owners in the context of South Africa represents further inequalities due to their limited access to training and lack of funding towards constructing or upgrading their facilities (Ashley-Cooper *et al.*, 2019; Hall *et al.*, 2019). These inequalities have a direct impact on access to quality learning environments, which I will analyse through the spatial justice lens.

3.5 CONCLUSION

The theoretical framing of my research presented in this chapter included three core components of the relationship between children and their environment, situated in the paradigm of phenomenology, with the positioning of childhood development in the ecological systems framework while seeking justice. This combined framework was established through the review of literature (Chapter Two) and provides a complex lens that can be applied to the exploration of the embodiment of ECD space, using the research question: What is the relationship between responsive learning environments and early childhood development policy transformation in South Africa?

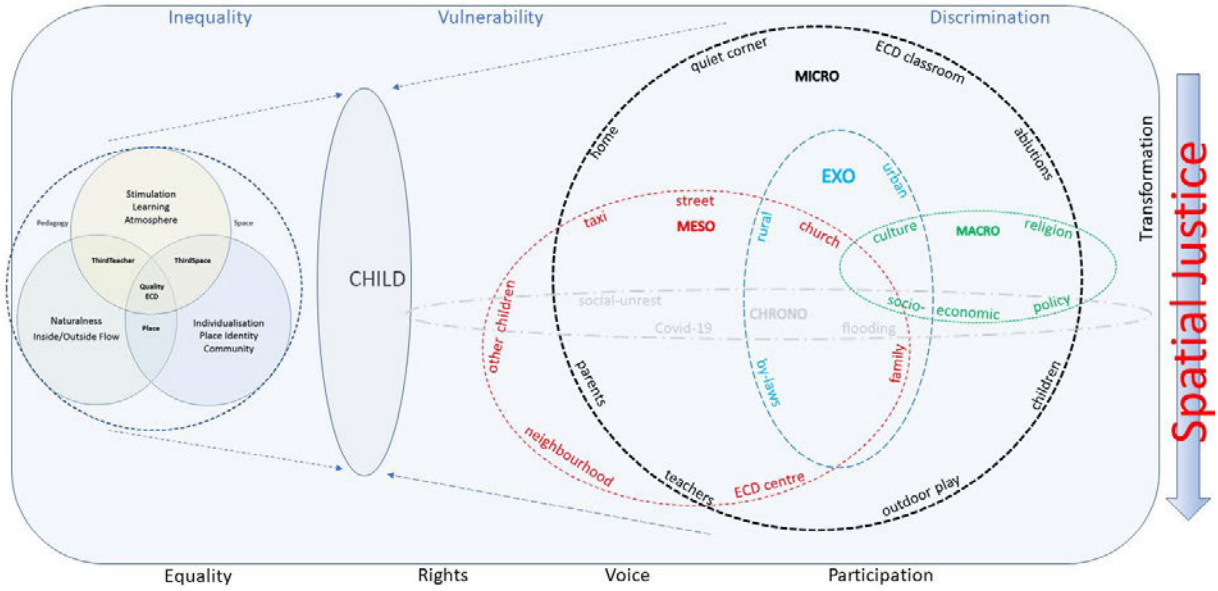

Figure 3-3 Multiple theoretical framing
Source: Cloete (2024)

The theoretical framing of ECD learning environments using the phenomenological lens as presented in Section 3.2 brought together the multiplicity of childhood in the ECD setting using the concepts of place, the third teacher, and the third space. It is my argument that the understanding and exploration of the learning environment (social and physical) rather than the mere learning space requires the bringing together of the three interrelated concepts as illustrated in Fig 3-3. Furthermore, when combined, the three concepts can be applied to explore the quality of the ECD learning environments in the country.

The second framing is based on ecological systems theory (Bronfenbrenner, 1979), which frames the development of children in relation to a multi-scaled environmental system that includes the physical, social, cultural, and political dimensions of child development. However, the theoretical underpinning of pattern language (Alexander *et al.*, 1977) places the ecological systems in parallel with the phenomenological approaches of the place and the third space to capture the complexities of the ECD learning environment. The inherent silent language of the environment relates to the concept of the learning environment as a third teacher. My reinterpretation of the ecological systems model shifts the focus from an outsider's perspective towards a child's rights perspective, to be viewed from the child's position in the ECD learning environment and as an eco-system where other systems intertwine.

Moving into the final framework, the children's rights perspective is extended to consider the inherent inequalities in early childhood development. The position of children and the inequalities in ECD provision in South Africa can be explored using the lens of social justice. The spatiality of the inequality is further considered using the theory of spatial justice (Soja, 2010) and its relationship with the third space to extend the rights approach in the architectural/environment discipline, bringing together the notion of quality learning environments for all children.

The literature review revealed just how complex and multi-layered the relationship between ECD and the learning environment is. My research being set in the context of a developing country with incredible inequality adds further layers of complexity to the relationship between the two. The research acknowledges this complexity with the development of a multifaceted theoretical framework created by combining phenomenology (through the concepts of 'place', the 'third space', and the 'third teacher') with the reconceptualisation of ecological systems theory and pattern language (with social and spatial justice). These lenses are individually applied to the data analysis process and provide a nuanced understanding of the case study sites and the literature. The details of the application are provided in Chapters Four and Six and furthered in the discussion in Chapter Seven.

4. CHAPTER FOUR – RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter maps the methodology through a discussion of the research approach, philosophical underpinning, research design, and details of the research methods used for data collection, analysis, and interpretation. Creswell and Creswell (2018) determine that research approaches fall into either quantitative, qualitative, or mixed methods. The predominant approach to this research is qualitative, within the natural setting of a collective case study that includes eight research sites.

In Chapter One, the research problem was defined to consider that the condition of learning environments in South Africa falls within a broad range, from barely providing the minimal requirements for health and safety to marginally adequate classrooms and purposely designed, well-equipped learning environments at the other end of the spectrum. As discussed in Chapter Two, Section 2.4, the ECD policy in South Africa provides only minimum requirements for health and safety, and research has shown that these issues are exacerbated as a result of government funding for the ECD sector that does not include developing new infrastructure. Thus, the relationship between quality early childhood development (ECD) and learning environments (LE) is not recognised in the policies that support ECD in South Africa, thus perpetuating the cycle of inequality.

I therefore argue that the implementation and development of ECD policies that disregard the potential of a responsive approach to learning environments and the context and people in these environments are inhibiting the transformation of early childhood development in South Africa. The philosophical positioning, approach, and research design are specific to exploring the complexity of the research problem from different perspectives.

In this chapter, the how and why of the research study are unpacked in relation to the relevant methodological, theoretical, and contextual literature. True to the nature of qualitative approaches, the research design evolved through engagements with the sites and participants (Denzin and Lincoln, 1994; Lucas, 2016; Creswell and Creswell, 2018).

As an architectural research project, it is appropriate to include scientific measurements and explore the phenomenon (Grout and Wang, 2013). The choice of a participatory approach to research stems from the notion of children's rights, as advocated for by the *Convention on the Rights of the Child* (1989), where data is collected explicitly to allow the voices of women and children that constitute the ECD sector (Lahman, 2008; Creswell, 2012).

The chapter is structured from a broad philosophical approach to detailed explanations of the research design, data collection, and analysis processes. Table 4-1 below provides an overview of the research design in relation to the research objectives and questions. The final sections consider the ethical considerations and the limitations of the study. The research onion diagram in Fig. 4-1 illustrates the various levels of research discussed.

The research methodology and research design aim to explore the primary research question:

- What is the relationship between responsive learning environments and early childhood development policy transformation in South Africa?

Table 4-1 Research Design Matrix

	Objectives	Research Question	Theoretical Position	Data Sources	Sample Size	Data Collection Methods and Instruments	Data Presentation Forms and Styles	Data Analysis Methods
1	To determine the relationship between ECD transformation and ECD learning environments.	What is the relationship between ECD transformation and responsive ECD learning environments?	Phenomenology, ecological systems theory, and spatial justice.	Literature review	N/A	Literature review and policy review.	Narrative and tabulation.	Content and thematic analysis.
2	To explore the relationship between the quality of ECD and the quality of ECD learning environments.	What is the relationship between the quality of ECD and the quality of ECD learning environments?	Phenomenology – place, third teacher, and third space – and pattern language	Literature review	N/A	Literature review	Narrative and tabulation	Content and thematic analysis,
3	To review the status of ECD transformation in South Africa.	What is the status of ECD transformation in South Africa?	Social justice	SDG 4, National Development Plan, ECD policy, UNESCO reviews, and review of ECD in SA	n/a	Literature review, policy review, and statistical info.	Narrative	Literature review
4	To assess and analyse the qualities of ECD learning environments of a selection of ECD centres in two diverse socio-economic contexts in eThekwini, KZN, South-Africa.	What are the range and qualities of the ECD learning environments in two diverse socio-economic communities in the Durban metropolitan area of South Africa?	Phenomenology – place, third teacher, and third space – and pattern language	Case study, phase 1 and 2	8 ECD sites	Architectural survey, LE evaluation, class observations	Narrative, architectural plans, photo narrative, and tabulation	Architectural quality analysis, environmental quality analysis, and evaluation of the potential of LE
5	To understand ECD learning environments from the lived experiences of the adult and child occupants.	How do the selected ECD centres' occupants (children and adults) experience their learning environments?	Ecological systems theory	Case study, phase 2	7 principals, 7 teachers	Interviews	Narrative, tabulation,	Deductive coding and thematic analysis
6	To review how the SA policy framework and ECD policy impact the quality of ECD learning environments.	How does the South African policy framework impact the quality of ECD learning environments?	Phenomenology, ecological systems theory, and spatial justice	Literature, case study phase 1 and 2, and policy review	8 ECD sites	Case analysis and policy review	Narrative, tabulation, and graphic illustration	Content and thematic analysis

Source: Author (2019)

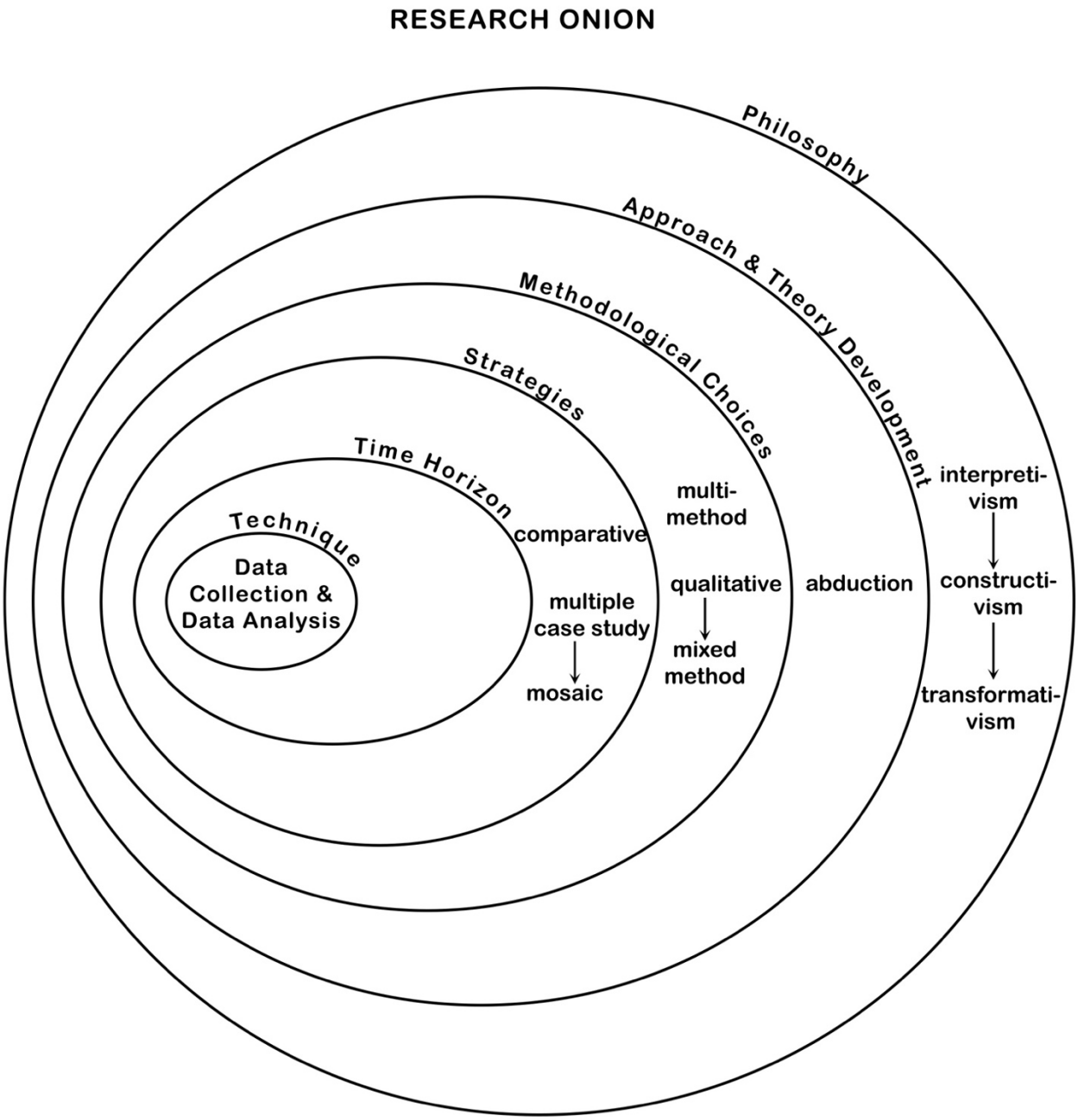

Figure 4-1 Research Onion

Source: Adapted from (Saunders, Lewis and Thornhill, 2007)

4.2 RESEARCH PARADIGMS

The title of my research project, *Transformation of Early Childhood Development and Responsive Learning Environments: A Collective Case Study in Outer-West eThekwini, KwaZulu-*

Natal, South Africa, introduces the notion of change or transformation at the outset. The use of a theoretical framework that includes a phenomenological lens, a reconceptualised ecological systems lens, and a social/spatial justice lens is used to determine ontological, epistemological, methodological, and axiological views. The inclusion of transformation requires the positionality of the researcher in the philosophical research paradigms that enable a depth of engagement that allows co-construction and an inherent criticalness in terms of what is found.

At the outset of the research process, I positioned myself within the interpretive/constructivist research paradigms (Creswell and Creswell, 2018). In contrast to positivism, interpretivism acknowledges that no single verifiable reality exists, and it enables the social construction of multiple realities. Mitchell (2011) argues that the interpretive/constructivist worldview allows for knowledge to be co-constructed by the researcher and the participants. My approach was to combine participatory and non-participatory data collection in a staggered process towards the co-construction of the knowledge required. From an architectural perspective, I also positioned myself within the phenomenological paradigm, where phenomena are described rather than explained and the focus is on experiences.

The research design followed a process that included me getting to know the participants on an informal basis over time. I had introductory meetings while conducting non-participatory observations before conducting the unstructured interviews and class observations (Lippman, 2010b; Creswell, 2012; Sussman, 2015). The notion of co-constructing knowledge with children in the early childhood development environment is also embedded within the mosaic approach established by Clark (2007; 2010b), which was part of the original research design, prior to the advent and associated complications of the COVID-19 pandemic. The non-empirical components of the research design included a review of the international approach and the local early childhood development policy framework included in Chapter Two, Section 2.4. and Chapter Five, Section 5.2.

The need for transformation at a higher level became evident during the extended process of visiting the early childhood development centres and talking with the participants. The unstructured interviews kept referring to funding and the lack of governmental support, which

was later confirmed through a review of the literature and policy (Section 2.4). From this experience and the knowledge gained, it became evident that the most appropriate worldview for research that aims to critique and transform society is the transformative paradigm (Mertens, 2007; 2010; Creswell and Creswell, 2018). The transformative paradigm is aligned with the theoretical framing of phenomenology, ecological systems theory, and specifically, social and spatial justice.

Mertens (2010) postulates that the transformative lens is best suited for research dealing with social justice and the human rights of marginalised groups with no voice. Through this lens, research approaches can be combined to address the complexities of inequality related to gender, culture, disability, and other marginalised groups. The interrelation between politics and inequality or oppression can be confronted with a multi-layered agenda. The transformative paradigm emerged from the constructivist paradigm and thus shared the notion of the co-construction of knowledge at its core. However, the need for change and reform differentiates the two lenses. According to Mertens (2010), the critical characteristics include:

- A central focus being placed on the lived experiences of marginalised groups and the strategies they develop to withstand and challenge conditions.

This study captures the lived experiences of the women who own and manage the ECD centres. The journey of developing their pre-school indicates resilience as a result of the need to make do or adapt to make the best of a poor situation.

- The unequal relationships and inequalities based on their minority status form the focus of the research.
- Inequalities and marginalisation are directly linked to political and social action.

In this study, unequal relationships and inequalities occur on two levels. In the first instance, the relationship between government departments and the ECD sector is unequal, with the ECD sector constantly left to fend for itself. The support from various voluntary groups, non-government organisations (NGOs) and religious groups, still tends towards unequal relationships due to the minimisation of their voices. The case study design is based on the stark inequality between the haves and the have-nots due to their socio-economic conditions.

My role in the research was first as an expert investigator due to my prior knowledge as a professional architect with experience in learning environment design in England. This position was strengthened by my experience as a researcher, as I completed a Masters dissertation dealing with a similar topic and investigated four ECD case study sites. My own lived experience includes being a parent who raised four children who all attended pre-schools, some in the same physical contexts as those in the case study collection. These positions provided a critical lens towards learning environments to enable best practice and seeing potential in places.

However, the research approach called for co-construction, and a voice for the participants representing marginalised women and young children (Mertens, 2007). To minimise my role as an expert, I appointed two research assistants to assist with the data collection. The first assistant, Sonali Chetty, had completed her Master's Degree in Architecture in 2019 by investigating a topic dealing with vulnerable children. However, her position also included being young, non-white, and a physically small person, which helped position her within the classes without causing disruption. She showed a natural ability to blend in with the children and understood a fair amount of isiZulu. The second assistant was working on his master's degree in architecture. He had minimal experience or prior knowledge of early childhood environments, which removed the expert view from his observations.

The importance and significance of quality ECD learning environments were confirmed and investigated in the review of the literature in Chapter Two, Section 2.2, and specifically Section 2.3, which investigated the research to inform the understanding of the quality of the ECD learning environments. Investigating the quality of physical environments and how children and adults experience these spaces was found to be an emerging field of research with the potential to contribute to the implementation of children's rights and the SDGs (as discussed in Section 2.4). Notably, the literature indicated limited learning environment research from developing countries and South Africa, with only a handful focusing on ECD spaces. Therefore, the research design and strategy were developed to address the gap in knowledge of the quality and experiences of ECD learning environments in South Africa.

4.3 RESEARCH DESIGN AND PROCESS

The research design can be described as an inquiry procedure (Creswell and Creswell, 2018). In the field of environment and behaviour and architectural research, the case study design was selected as the most appropriate form of investigating the phenomenon and setting (Groat and Wang, 2013; Lucas, 2016; van Liempd, Oudgenoeg–Paz and Leseman, 2019). The case study is further an ideal inquiry process with which to capture the richness and depth of socio-physical explorations, as it moves beyond the measuring of the physical environment using scientific variables to capture the qualitative concerns of the intangible and subjective.

However, the complexity contained in the research problem meant that a single case study would not provide sufficient evidence for the research. The research design had to bring together the range of built forms and types of infrastructure that support the ECD sector in South Africa. The combination of eight research sites, which included a range of built forms and socio-economic settings within a collective case study design, seemed like the most appropriate method to capture the diversity in the learning environments.

Groat and Wang (2013) postulate that in architectural research, the case study design includes the following five distinctive characteristics: 1.) the study of phenomena or settings that could be singular or multiple in a real context; 2.) it enables the study of relationships and looks at causes and effects; 3.) the development of theory through the research design; 4.) the combination of different methods of data collection and analysis to allow for triangulation; and 5.) it has the potential for theory generalisation. Using these characteristics, I developed my case study research design to include the following:

1. A collection of eight research sites in a real context.
2. The study of the relationship between the ECD learning environments' quality and the effect of the quality on the users.
3. The application of a theoretical framework (Chapter Three) that allowed for further theorisation using the analytical frameworks developed and the findings presented.
4. The data collection and analysis combined a range of methods.
5. The potential for generalisation was possible once the first four criteria were met.

As described above, the research design brought together evaluative methods from an architectural survey and learning environment research tools with the constructivist approaches of interviews and participation within the interpretive/transformative paradigm. Data collection, therefore, included a phased process of introductory meetings, informal discussions during the survey period, and more in-depth interactions during the interviews and engagement with participants.

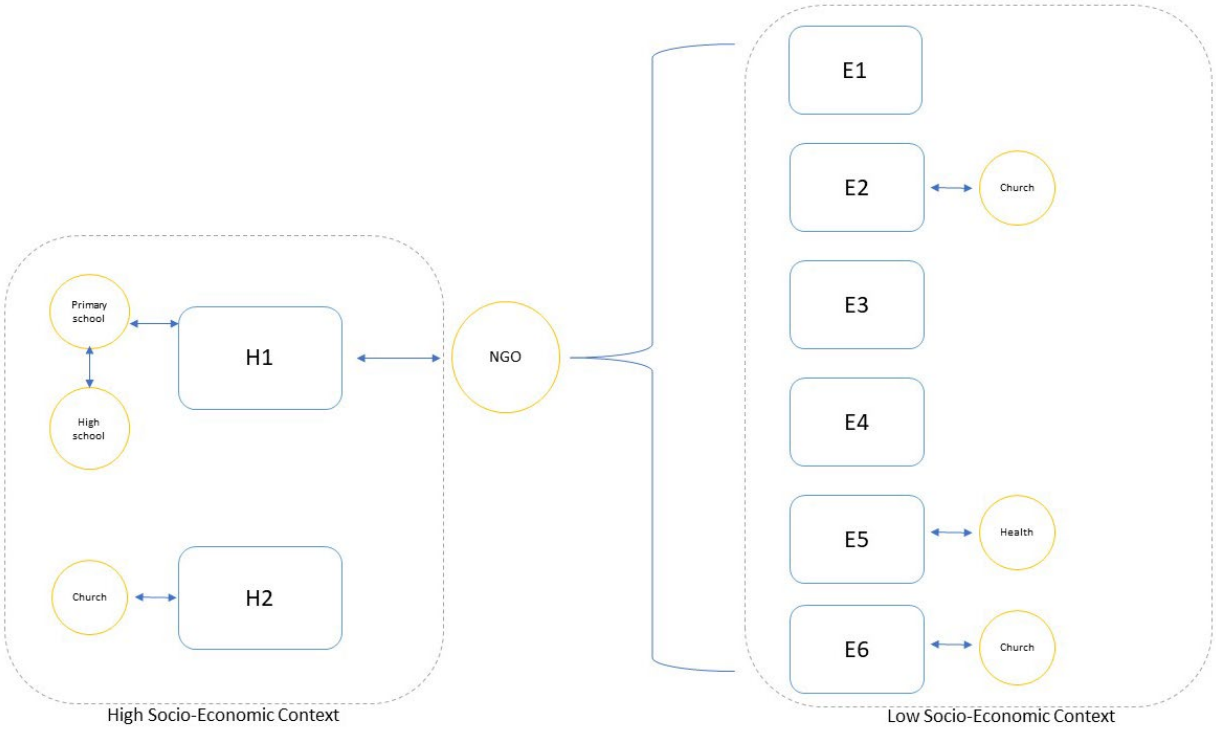

Figure 4-2 – Collective Case Study Design

Source: Author (2019)

4.3.1 QUALITATIVE APPROACH

The predominant approach to the multiple-case study research is qualitative, in a natural setting (Groat and Wang, 2013). The review of learning environment research indicated that both quantitative and qualitative approaches can be used when investigating the quality of physical spaces (Bernard, 2012; Adams and Savahl, 2017; Barrett *et al.*, 2019; Berti *et al.*, 2019). However, more recent trends have started favouring mixed methods or a qualitative approach to include the co-construction of knowledge with teachers and children (Clark,

2010b; Botsoglou *et al.*, 2019; van Liempd, Oudgenoeg–Paz and Leseman, 2019), specifically when working from a rights-based perspective.

Qualitative research tends to be multi-method, combining interpretive and naturalistic approaches to a study and enabling the interpretation of phenomena in terms of how people understand and experience them (Creswell, 2012). Furthermore, qualitative research holds an underlying inductive process because of the open-ended nature of the research questions and methodology (Denzin and Lincoln, 1994; Groat and Wang, 2013). The qualitative approach in architecture and people-environment studies enables field research to focus on a specific context to provide a real-life understanding of the context (Groat and Wang, 2013; Lucas, 2016; Matthews and Lippman, 2020).

Bringing together various data forms, such as interviews, photo documentation, observations, and participatory field notes, can become messy. However, the depth gained adds to the potential trustworthiness of the research while contributing to knowledge that can be related to practice (Lucas, 2016). In my research design, the quantitative form of data collection consisted of surveying the physical characteristics (floor areas, construction materials, etc.) of the buildings and sites, as well as measuring the human comfort levels (considering the environment's temperature, acoustics, lighting, and humidity). However, when viewed through the phenomenological lens, the physical characteristics that are measurable need to be considered beyond their exact quantities to understand the lived experiences of perceptions, enabling a holistic understanding of the quality of the environment (Lippman, 2010b; Barrett *et al.*, 2015).

Furthermore, the choice to include a participatory approach to research stems from the notion of human and children's rights, as advocated by the *Convention on the Rights of the Child* (1989), where the data is explicitly collected in a manner that allows or incorporates the voices of the children and women who serve the early childhood development sector (Mertens, 2007; Creswell and Creswell, 2018). As discussed in Chapter Two, the positioning of children and educators in the research process is in line with recent developments in learning environment research and supported by the theoretical framing of third space and spatial justice through critical spatiality (Cleveland and Fisher, 2014; Jobb, 2019).

4.3.2 SELECTION OF THE CASE STUDY

The primary data is in the form of a collective or multiple-case study of a selection of early childhood centres (pre-schools) in affluent and disadvantaged sites in the Outer-West zone of the Durban eThekwini Metropolitan Area. The inclusion of two diverse socio-economic settings allows for comparative analysis towards understanding the inequality (spatial injustices) of early childhood development inherent in the context of South Africa (Ashley-Cooper *et al.*, 2019; Hall *et al.*, 2019).

The selection of the case study sites was purposive (Privitera, 2017), with two affluent and six disadvantaged centres. All the centres are located within the same geographical region. The six centres in the impoverished context have an established relationship with an NGO, which also has a relationship with one of the affluent ECD centres. The NGO forms part of the study to provide a connection and access to the centres in the disadvantaged context. Furthermore, the NGO is actively working towards spatial justice and has completed two projects to improve the physical learning environments of centres, one of which formed part of the case study.

4.3.3 SAMPLING METHOD

All the ECD centres formed part of a more in-depth investigation and case analysis. At the outset, the intention was to interview the principal of each centre and one teacher. This would have provided a 100 per cent sample in terms of principals and approximately 40 per cent for teachers. Due to individual circumstances during the data collection period, one of the two principals and one of the teachers were not available on the day. Attempts were made to rearrange the meetings, but these did not materialise. For the observations, a representation of the age-group classes was selected at each site to include the various age ranges. Where schools consisted of one class per age group, that formed the sample. There was no direct engagement with the children, and the interviews with the teachers and principals who participated in the study were not conducted formally (Sussman, 2015).

The selection of eight case sites allowed for an appropriate depth of engagement in conducting the qualitative research. Furthermore, the phased approach to the research

process enabled each community to become familiar with me as the researcher before further data collection activities continued (Denzin and Lincoln, 1994).

4.3.4 RESEARCH PROCESS

The research project commenced by developing the research problem, questions, and overall research approach. Various contexts for the research were considered to find a suitable representation of the divided range and types of ECD facilities. The diversity of early childhood development provision was described in Section 2.3.2, and the contexts selected provided a unique picture of the diverse nature and often unequal provision of early childhood learning in the South African ECD centres (Ashley-Cooper *et al.*, 2019). The diversity in the selected area is due to the physical context and the bordering of two distinct socio-economic contexts representing suburban and peri-urban areas (tribal) of the city of Durban in KZN.

The first stage of engagement with the research context and potential participants was to gain access to the research context and identify potential research sites for the collective comparative case study. The process started with an email inquiry to the director of the NGO, which was followed by a meeting to discuss the research project. Similarly, requests via email were sent to three pre-schools in the affluent area, followed by discussions with two of them. Only one of these centres was open to participation in the research. The second pre-school representing the affluent area was accessed via the director of the NGO, who was also the owner of the school and site.

This initial process was followed by visits to the ECD centres that had established relationships with the NGO. The NGO representative, a Zulu woman, accompanied me to each site. She provided background information and introductions to each of the principals. With her guidance, six research sites were identified for the research project. All six of the principals welcomed my engagement and interest in their school.

This initial engagement enabled the introduction of the research project's aims and me as the researcher, and I was able to obtain the required permission for the study with the signing of gatekeepers' letters. The fieldwork could commence following the approval of the ethical application by the Humanities and Social Sciences Research Committee at the University of

KwaZulu-Natal (UKZN) in July 2020. A phased approach was planned, where the physical buildings would be investigated first, followed later by interviews, class observations, and a mosaic approach with some of the children. The phased approach is illustrated in Fig. 4-3, which details the process of the empirical research. Note that the mosaic approach, which included child participation, was subsequently removed from the main study and reported on in Chapter One as a pilot study.

The measurement of human comfort levels with the MC350 device was conducted during the second phase of data collection. The objective of each of the stages was as follows:

- Phases one and two aimed to answer research question no. four: What are the range and qualities of the ECD learning environments in two diverse socio-economic communities in the Durban metropolitan area of South Africa?
- Phase two also aimed to answer research question five: How do the selected ECD centres' occupants (children and adults) experience their learning environments?

While the empirical data collection had to be contained to specific times, the engagement with the secondary data continued throughout the process. This approach enabled the literature to be informed by the data collection and for the review of the literature and the development of the theoretical framework to be informed by the data collection from the literature. The empirical research was conducted in two stages, with each site visited on three occasions over a period of six months to ensure the depth of engagement and trustworthiness of the findings. The study population consisted of a percentage of the participants that represented the developmental stages of early childhood and a range of cultural backgrounds and genders.

Due to the nature of qualitative research and architectural design research, I anticipated that the methodology for the qualitative data collection and analysis needed to allow for flexibility. The study was intended to develop as the exploration of the phenomenon indicated the true nature of each site (Denzin and Lincoln, 1994; Mitchel, 2011; Grout and Wang, 2013). However, as indicated in Chapter One, the research project was conceptualised prior to the advent of the COVID-19 pandemic and had to be reconsidered to contain my presence at the research sites. A further data collection period was originally envisaged that would have included a co-design (participatory) project at one of the centres; however, the complications of the pandemic and social unrest in the area during 2021 negated the opportunity.

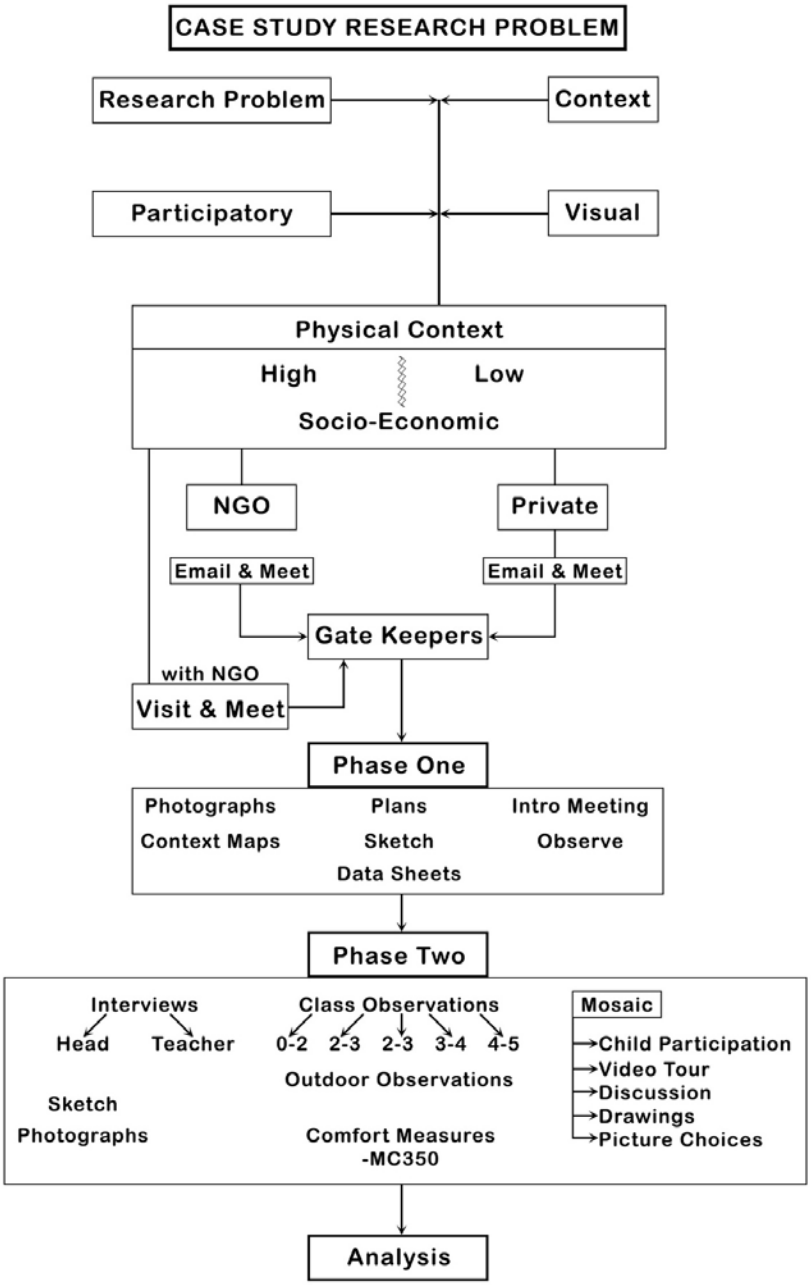

Figure 4-3 Flow Diagram of the Research Process from the Research Problem to Data Collection

Source: Author (2021)

4.4 DATA COLLECTION AND ANALYSIS

In parallel with the literature review, the collective case study was designed to investigate the research problem and primary questions: What is the relationship between responsive learning environments and early childhood development policy transformation in South Africa? The sections below provide the details of the primary data collection and analysis, including the range of instruments used. The research policies, trustworthiness, and ethics are explored in the final section.

4.4.1 PRIMARY DATA COLLECTION METHODS AND TOOLS

In the collective comparative case study, two distinct processes were combined to build a layer of in-depth investigation. This was done to answer the question: What are the range and qualities of the ECD learning environments in two diverse socio-economic communities in the Durban metropolitan area of South Africa? The data collected to answer this question related to the physical environment and measurements of the environmental quality of each of the research sites. The data relating to people and their perceptions, observations, and voices provided insight into the question: How do the selected ECD centres' occupants (children and adults) experience their learning environments? The question of: How does the South African policy framework impact the quality of ECD learning environments? is addressed firstly by the interviews with the ECD centre principals and secondly by the physical environment data.

On a broader level, the empirical data also provided insight into the relationship between ECD transformation and ECD learning environments.

4.4.1.1 PHYSICAL ENVIRONMENT AND MEASURING THE ENVIRONMENTAL QUALITY

The investigation of the physical environment of the research sites formed an essential point of departure for the research. The research question is: What are the range and architectural qualities of the ECD learning environments of a selection of ECD centres in two diverse socio-economic communities in eThekwini, KZN, South Africa? This question requires a multi-layered understanding to include the variety of building plans, forms, scales, construction systems,

materials, and qualities, each within their own context. Here, quality refers to the suitability of the environment for its purpose as a place, a third teacher, and a third space for the care and development of children between 0-7 years, as was established by the review of the literature in Chapter Two, Sections 2.2 and 2.3, and furthered in the theoretical underpinning in Chapter Three, Section 3.2.

The case study methodology, learning environment research, and environmental psychology method examples used were primarily from the UK, US, and Australia, as reported in Chapter Two (Bernard, 2012; Ferguson *et al.*, 2013; Barrett *et al.*, 2019). The methodological approaches included some established quantitative tools, such as the CPERS method (Moore and Sugiyama, 2007), and holistic approaches that combined a range of research tools, like the clever classrooms project (Barrett *et al.*, 2015), which enabled an in-depth understanding of the quality of the physical environment and how it impacted children's behaviour and developmental processes (learning) (Bernard, 2012). During my review of the learning environment literature (Chapter Two, Section 2.2.2.3), it became evident that the holistic approach aligned better with the objectives of my study and was suitable for the context of South African early childhood development spaces. The data collection tools were established to include four instruments, namely: architecture, photography, an environmental comfort survey, and an environmental quality assessment, which are discussed in more detail below.

The first stage of the data collection included an architectural survey, a photographic essay, and measurements of the floor areas of the buildings. The data collection was completed in August 2020, while most of the centres were still closed due to government restrictions following the COVID-19 pandemic. The school principals and teachers had already prepared the learning environments to meet the Department of Social Development's (DSD's) requirements to minimise the risks of spreading the virus in these spaces. According to the DSD's directive, the pre-schools had to be inspected and receive approval from the department before they could accept any children (Berry *et al.*, 2021; Wills, Kotzé and Kika-Mistry, 2021). Notably, when my data collection commenced in August 2020, only three of the centres had received approval and had children attending. A similar scenario was reported in other areas of South Africa at the time (Wills *et al*., 2021).

ARCHITECTURAL SURVEY

The review of the literature (Section 2.4.2) indicated that there was limited learning environment research in developing countries and in South Africa specifically, from an architectural perspective. However, the inclusion of an architectural survey methodology provides the research with an understanding of the nature of the built form (Dierkx, Rene, 2002; Bernard, 2012). Following this approach, the purpose of the architectural survey was to establish the nature and condition of each of the physical facilities, sites, and surrounding areas of the selected early childhood development centres. The survey design included a review of the architectural drawings, as available, or the physical inspection and documentation of the built form. Data collection included measuring the floor areas of the buildings and spaces and recording their characteristics, building materials, and construction technologies using an observation schedule similar to the one that Dierkx (2002) applied to his survey of primary schools in Kenya. The survey further reviewed and documented the conditions of the buildings and outdoor play areas to assess their ability to meet essential health and safety requirements and the need for building maintenance and improvements for each site.

The data on all the pre-schools was recorded on the observation schedules to provide a comprehensive picture of the research sites. Table 4-2 provides the thematic grouping of the survey criteria, along with the descriptions that guided the survey process.

Table 4-2 Architectural Survey with Themes, Criteria, and Descriptions

Theme	Criteria (Code)	Description
Geographic	Macro context	The broad urban/rural/per-urban area surrounding the site - as a determinant of the density, scale of the built-form, and related to the broad socio-economic characteristics.
	Micro context	The immediate area/neighbourhood surrounding the site - as a determinant of the relationships with the community, scale of the built-form, and related to the socio-economic characteristics.
	Access routes	Type and condition of the road or road network to enable public transport, and private vehicular and pedestrian access.

	Topography	The fall/slope of the site – as a determinant of the buildable land and outdoor play area available.
	Site area	Scale of the ECD centre plot/site.
Building(s) – Internal	Layout / spatial arrangements	The composition of the spaces on the plan – linear, U-shaped, free standing etc.
	Number of classes (learning spaces)	Scale of the ECD centre – relates to the spatial arrangement and numbers of children.
	Ablutions	Numbers of toilets and wash hand basin for children and adults. Arrangement in relation to classes. The condition of the facilities – this is a criterion to meet minimum health and safety requirements and dignity.
	Support spaces	Potential of multipurpose spaces for specialisation, as break-out spaces and accommodation for staff. Kitchens and dining areas are relevant too. Storage is a critical component in an educational facility.
Floor Area Ratios	Floor areas of the learning spaces	The number of spaces and areas in square metres determine the space available per child.
	Number of children	The total capacity (number of children) of each centre and the number of children per class, as determined by the space available.
	Floor area per child (ratio)	The ratio of child-to-space is a determinant of density, comfort, and the potential for exploration –high density leads to crowding and behavioural concerns.
Building Construction	Construction materials and methods	The materials and methods of construction have a direct impact on the buildings' performance in relation to thermal control. They also determine the regularity of the need for maintenance and their robustness.
	Construction date or dates (if in phases)	The age of the structure impacts its condition. If constructed in phases, different sections may include different material and conditions.
	Condition of the buildings	The performance and appearance of the physical environment have a direct impact on how a building is experienced and perceived.
Outdoor Play	Outdoor play area size	The scale of the outdoor play area needs to be able to support the number of children in the centre.
	Outdoor play area size per child (Ratio)	The area available for outdoor play need to enable the freedom associated with the outdoors. Limited space will reduce the range of activities and could lead to behavioural problems.
	Outdoor play area's range	Outdoor play needs to include a variety of activities to support the motor development and different needs of children.
	Outdoor play area's condition	Outdoor equipment needs to meet health and safety requirements to ensure the safety of children. Over-use of

		equipment as well as grassed areas impact the experiences of children.
	Natural features/garden	The inclusion of a variety of natural features, textures, smells etc. are critical for the sensory development of children. Trees also provide shade during the warm summer months.

Source: Author (2020)

The documentation provided information on the range of provisions and scale of the eight centres and detailed descriptions of the variety of architectural qualities. The floor areas of the various learning spaces and the numbers of children could be compared, providing insight into the group sizes and floor area per child ratios. These ratios are widely recognised for providing insight into quality (Bernard, 2012). The data analysis considered how each site performed within the thematic criteria to provide a qualitative assessment rating of poor, adequate, or good. The process was furthered through the spatial justice lens to consider the level of quality in relation to the socio-economic position, as well as considering how the intervention of the NGO working towards spatial justice impacted the quality of the learning environment (Madyibi and Bayat, 2021; Fredman *et al*., 2022).

PHOTOGRAPHIC AND DRAWINGS SURVEY

Visual records of observations form part of the architectural researcher's toolkit, specifically within a case study methodology (Zeisel, 1984; Lucas, 2016). These may include sketches and photographs that supplement the on-site recording of observation schedules and other fieldnotes and can be used for further analysis, similar to written or voice recordings (Gifford, 2015; Knauf, 2019). In the environment-behaviour research domain, photographs are often used for socio-spatial analysis to understand how people inhabit their physical spaces (Cheng, 2015; Sussman, 2015). Hence, my site visits included a comprehensive photographic record of the internal spaces, exterior built form, outdoor play areas, and surrounding sites of each location. I took care to take photographs of the views from the windows over the surrounding areas, as well as to capture the conditions of the buildings and equipment to gain a holistic view of the physical environment. The photographs, sketches, and other drawings formed an additional layer of understanding of the architectural analysis and formed the basis of the environmental quality evaluation. The process included sorting the visual material into the

thematic categories of stimulation, individualisation and naturalness, as established in the clever classrooms methodology (Barrett *et al.*, 2015).

ENVIRONMENTAL COMFORT SURVEY

The inclusion of an instrument to measure human comfort is rooted in environmental psychology, where the relationship between people and the environment is included in research that identifies physical dimensions as a key variable that is measurable in comparison to how people behave (Bechtel and Churchman, 2002; Ferguson *et al.*, 2013). Optimal conditions for human comfort have been established to provide designers with a framework and standard that various building typologies should achieve (Canter, 1974; Barrett *et al.*, 2017).

The data collection measured the human comfort level using the EMC350 device and application developed by Saint-Gobain. This evaluation is intended to provide reliable data regarding the temperature, acoustics, lighting, and humidity in the environment. These measurements indicate the perceptual comfort of a person inhabiting the space, as each impacts their well-being (Barrett *et al.*, 2015). The results provided a measure of how the building performed in terms of providing a comfortable environment on the day the measurements were taken. The measurements were collected during the class observations and interviews, meaning that both the participants and the research team experienced the settings. The analysis of the human comfort readings formed part of the overall rating of the performances of each site, particularly in terms of the naturalness component of the environmental assessment that includes daylight, fresh air, and noise as key variables (Barrett *et al.*, 2015).

ENVIRONMENTAL ASSESSMENT

From the outset, the purpose of the environmental assessment was to capture the range of learning environments represented in the sample and what qualities could be found. The environmental assessment therefore provided more than just the physical dimensions and building elements required by the minimum standards. The focus thus shifted to evaluating

from a holistic perspective, where the atmosphere and potential as a learning environment could be captured rather than simply the learning space.

The environmental quality study and assessment were designed following the review of the different approaches to learning space and learning environment research included in Chapter Two. The majority of the research is from Europe and North America, with some new approaches from Australia and New Zealand. (Bernard, 2012; Barrett *et al.*, 2019; Berti *et al.*, 2019; Matthews and Lippman, 2020), but minimal research from developing countries. Furthermore, the research methodology favoured quantitative approaches and more extensive studies. However, some more recent studies following a qualitative approach towards a holistic evaluation of the environment were identified, which showed the potential for being adapted to the developing world context (Lippman, 2010a; Barrett *et al.*, 2015; Matthews and Lippman, 2016; Knauf, 2019).

My research design thus included a holistic investigation of the environmental attributes following the methodology developed by Peter Barret and his colleagues as part of the Holistic Evidence and Design (HEAD) project (Barret et al., 2015). The criteria for the clever classrooms approach were established through a rigorous research process of investigating various sensory factors to establish those with the most influence. Those most influential were naturalness (light, temperature, and air quality), individualisation (ownership and flexibility), and stimulation (appropriate level of complexity and colour). Indicators include:

- Good 'natural' conditions such as lighting, air quality, temperature control, acoustics, and links to nature.
- Age-appropriate learning spaces that offer flexible learning opportunities that pupils can adapt and personalise.
- Connections between learning spaces that are easy to navigate and that may provide additional learning opportunities.
- Mid-level ambient stimulation using colour and visual complexity.
- Schools that are designed from the inside out (classroom to school) so that each space meets the needs of its inhabitants.
- Designs that take into account local climatic and cultural conditions (Barrett *et al.*, 2019).

Table 4-3 Breakdown of Learning Environment Characteristics that Improve Children's Learning

DESIGN PRINCIPLE	DESIGN PARAMETER	SPECIFIC CLASSROOM FEATURES THAT IMPROVE ACADEMIC OUTCOMES
Naturalness	Light	Abundant daylight but a low risk of glare, either through orientation or shading. Also, good quality electric lighting.
	Temperature	Control of heating and cooling in each classroom. The ability to avoid heat from the sun, either through orientation or adequate external shading.
	Air quality	Big window opening sizes at different heights to provide good ventilation in varying conditions. Larger classrooms to dissipate poor air. Air conditioning where necessary.
	Acoustics	Carpeted floors and the absence of adjacent external sources of noise.
	Links to nature	Views outside and, if possible, direct access to and use of outdoor learning spaces. Natural materials in the classroom such as furniture coverings and plants.
Individualization	Ownership[a]	Distinct design characteristics, personalized displays, and high-quality chairs and desks to foster a sense of ownership among students.
	Flexibility[a]	Larger, simple areas for older children, but more varied layouts for younger pupils. Easy access to attached break-out spaces and widened corridors for pupils' storage. Well-defined learning zones that facilitate age-appropriate learning options, plus a big wall area for display.
	Connection	Wide corridors with external views where possible, plus distinctive, orientating features, especially in relation to the doorways of particular classrooms. Circulation spaces large enough to use for educational activities, such as "corridor libraries."
Stimulation	Visual Complexity[a]	Visual variety in the room layout, ceiling, and display in balance with the use of displays to create interest but with a degree of order.
	Color[a]	Light walls generally, but with a feature wall or areas highlighted with brighter color, to produce an optimal level of stimulation. Bright color on furniture and in displays as accents to the overall environment.

Source: Barret *et al.* (2019)

The criteria of the learning atmosphere (third teacher), flow between the inside and the outside, place identity, and connection to the community were included in the data sheets completed at each research site to allow for a comprehensive evaluation of the ECD centres' responsiveness. These criteria were borrowed from the evidence-based approach to responsive learning environments (Lippman, 2010b).

It should be noted that the methodologies described above were designed for primary and secondary learning environments and were applied to developed country settings. However, the methods were specifically selected as the principles of what constitutes a quality learning environment, so they could be transferred to the context of South Africa. By merging the approaches by Barrett and Zhang (2009) with those by Lippman (2010b), the evaluation criteria accommodated the diversity inherent in the research sites.

The data was collected in August of 2020, using a hardcopy datasheet and following each of the 'clever classroom' criteria that had key prompts to guide my observations. My approach during the data collection was to familiarise myself with the space and atmosphere of the

centre, followed by observations of each space while taking photographs. As mentioned above, the photographs and sketches formed part of the analysis process towards evaluating each category, as the raw data was compiled according to the thematic criteria for each site before commencing with the documentation. The photographic process was repeated during the phase two visits to capture the spaces with the children and the activities.

The survey and environmental analysis of each site formed the microcosm of the children's worlds as a result of the theoretical framing of the ecological systems model (Edwards, 2005). Barrett *et al. (*2017) consider each classroom as a microsystem, where the whole school consists of multiple microsystems. I used the reconceptualised ecological systems model for early childhood development learning environments to frame this research, where children are central and the data from the architectural survey, photographs, and environmental quality data describe the world that they inhabit and engage with. However, the multiplicity of the ecological systems model required me to move beyond the physical domain towards the concept of the third space (Soja, 1996), where the interaction between people and place becomes evident. The potential for a voice and for social/spatial justice can be explored through this lens.

4.4.1.2 PERCEPTIONS, OBSERVATIONS, AND VOICE

The participatory forms of data collection formed a significant component of the research, in line with the constructivist and transformative research paradigms (Denzin and Lincoln, 1994; Creswell, 2012; Mertens, 2013). My research design included two approaches: firstly, observation of the learning environments to include a range of age groups and indoor and outdoor spaces; and secondly, interviews with the ECD centre principals and teachers at each site.

OBSERVATIONS OF THE LEARNING ENVIRONMENTS

The class/group observations formed an essential component of the overall investigation. According to the review by Berti *et al.* (2019), all the studies investigating the relationship between the behaviour of children and their learning environment were conducted through observations. Furthermore the methodology of observation has been well established in the

field of person-environment studies and a range of tools has been developed (Zeisel, 1984; Lippman, 2010b; Sussman, 2015).

The design of the research tools was adapted from methods originating from environmental psychology and applied to the post-occupancy evaluations (PoE) (Cleveland and Fisher, 2014). Various tools can be used to document behaviour. These include photography, video recording, behaviour mapping, and recording of physical traces (Lippman, 2010b). An observation schedule with the criteria for the observations was developed for the classroom observations, and fieldnotes were captured on the schedule. A time-based recording of activities was noted, and behaviour mapping was included in the form of sketches that indicated the positioning of the children and their activities in the spaces at that moment. This method of data collection is a type of systematic observation used to track behaviour in a specified space for a given time (Zeisel, 1984; Lippman, 2010b; Sussman, 2015).

Sussman (2015) identifies three approaches to observational studies: namely casual, passive and active. Passive observations can also be described as naturalistic or non-participant observations, according to Creswell (2012), as the environment is not affected by the research. The purpose of this type of observation is to capture how people behave in a specific setting. Creswell (2012) considers the key advantage of naturalistic observation as the first-hand nature and immediacy of the data collection that takes place in a real setting. He further considers it an ideal method with which to explore persons who are not well equipped to communicate their views, such as young children. However, the approach requires care and planning to ensure that the fieldworker (researcher) has clear parameters for how to observe and more specifically, what to look for (Sussman, 2015). For architectural research in an educational setting, Lippman (2010b) includes various tools such as photography, behavioural mapping, and the recording of physical traces, among others, as appropriate for the process.

The observational method of data collection can be traced back to Zeisel (1984) in the seminal text, *Enquiry by Design*. However, Sussman (2015) considers detailed criteria for this form of fieldwork. The notion of remaining concealed, or blending into the setting, is critical to the success of passive observations. Clark (2010a) further elaborates on the notion of being immersed in the research setting, while also validating the need for observation as a research

tool in early childhood research when understanding that children represent a unique profile. Various strategies can be used to achieve an undisturbed research setting. However, the need to conduct the research in the most natural setting raises ethical concerns in terms of obtaining consent. In observational research, the people, whether children or adults, that are in the space while being observed are not described as participants. Only once direct engagement is required does informed consent become necessary. Gifford *et al*. (2011); and Sussman (2015) agree that observation of people in a space can be conducted without informed consent. It is, however, relevant to review this ethical consideration when the research takes place over a long period of time, or could be defined as invasive of privacy. In my approach to the data collection through observations, it was important that the children remain unaware of the observations. Following a review of the literature, I deployed the following strategies to achieve a good level of natural behaviour for the observational data collection:

- Selection of a research assistant who was physically small and could be seen as an older child by the children.
- The research team, comprising myself and two research assistants, briefly went to each site two days before the research visits started. This was to familiarise the research assistants with the research sites and also for the children to have seen the 'visitors' at the centre before the actual data collection took place.
- The children were not specifically informed about the research. If they asked about us, the teacher could simply explain that their preschool/ECD centre had some visitors and that one of them wanted to spend some time in their spaces.
- The time in each space was kept short to minimise invasion of the children's spaces.

It was, however, not possible to become completely hidden in the space, as some children did approach the research assistant during the data collection period to engage with her. The more spacious classrooms allowed the researcher to stay unnoticed, while the smaller spaces made it more difficult. The activity in the class also impacted whether or not the children became aware of someone in their space. It was easier to remain unnoticed while they were engaged in their own activities. However, during story time or other collective activities of a more passive nature, their attention was less engaged, and some started looking around and

noticed the researcher. A further concern is that the teachers were well aware of the visit and may have conducted themselves differently or directed the activities of the children in a manner that they thought would be appropriate for researchers to observe. These observations during the fieldwork concur with the disadvantages of passive observations highlighted by Creswell (2012); and Sussman (2015).

The various age groups were identified at each research site to gain a comprehensive understanding of each group, and each was noted to be occupying a distinct space and learning environment. The observations of each group were limited to 25-35 minutes, and the data was collected using the following tools:

- Observation of activities.
- Observations of spatial and environmental characteristics.
- Behavioural mapping, which also gave an indication of some of the physical traces.

The class observations aimed to capture how the children inhabited their learning environment and how the space and environmental characteristics supported or inhibited the activities.

The class activities were recorded in the fieldnotes, following the methodology established by Creswell (2012). The recording times were scheduled, and five minutes of each class activity were described. The spatial and environmental characteristics observation was conducted at the same time, and the data was captured based on the following pre-determined criteria: the activities, the interior/exterior relationships, movement, and the interactions in the spaces – child/child, child/teacher, and potential/affordance (Lippman, 2010b; Matthews and Lippman, 2020). The behavioural mapping was recorded on basic plan drawings of each class, illustrating the children in their learning environment. At least one of the age groups was included in an outdoor environment, where possible.

The analysis of the observational data started with recording the field notes into schedules for each class at each research site. The dataset was reviewed carefully to identify themes and ideas to allow organisation into categories. The themes became a framework for coding, analysis, and development of a complex picture of the learning environments (Wilkonson and Birmingham, 2003; Groat and Wang, 2013). The analysis was furthered using the concepts of

the third teacher and the third space to consider the potential of the physical environment to become an enabling environment for children's exploration and interaction. The analysis also had to consider whether the activities were active or passive, as advised by Lippman (2010b). Space that enables exploration, independence, and development is a space with the potential for good-quality early childhood development. This is one of three dimensions of quality identified by Berris and Miller (2011) and others who echoed the notion of child-centred environments being good quality environments and promoting responsiveness (see Section 2.3.2).

INTERVIEW WITH PRINCIPALS AND TEACHERS

Interviews were conducted with the principals of each of the pre-schools, as this research is positioned within the qualitative approach and the transformative paradigm. These interviews took the form of unstructured interviews (Zeisel, 1984; Groat and Wang, 2013). In the educational setting of learning environment research, interviews form an essential component to gain access to educators', principals', and students' perceptions and experiences (Lippman, 2010b; Creswell, 2012; Matthews and Lippman, 2020). Qualitative approaches to environment-behaviour research need to consider people's real-world experiences and their perceptions and thoughts in relation to their environments (Seamon and Gill, 2015). Although surveys and questionnaires provide factual data, an interview that is open-ended has the potential to gather more in-depth data and create a sense of co-construction of knowledge. Participants also have the potential to influence or reframe the research design in an open-ended interview, and from a theoretical perspective, this co-construction aligns with the intentions of the third teacher (Clark, 2010a) and enables the research itself to become the third space (Ferreira *et al.*, 2018).

The interviews were therefore data collection instruments that allowed co-construction of the research data and gave a voice to the women who managed and/or taught in the ECD centres. Berti *et al.* (2019) add that semi-structured interviews are often used as an effective tool to obtain the perceptions of teachers in learning environment research. The flexibility of an unstructured interview also enables the researcher to establish areas of interest while giving some control of the interview to the interviewee (Wilkonson and Birmingham, 2003; Creswell,

2012). In an effort to further the co-construction and social justice of the research, the principal of each research site was asked to identify the teacher(s) to be interviewed. The teacher interviews were primarily conducted to access their views and experiences of the early childhood learning environment. Each interview discussion started with gathering a broader picture of the person and her experience before leading into the research topic.

The interviews were conducted in the space of the participants' choice, and in most instances, this was their office or an unused meeting room or classroom. The participants had previously met with me prior to the day of the interview, and this fostered a comfortable atmosphere. The participants signed the informed consent form and agreed to audio recording of their interview using a smartphone. The interviews were all conducted in English, as I found that all of the principals were comfortable speaking in English and were able to express themselves clearly.

The purpose of the interviews was to access the principals' views and perceptions of the learning environments and their pedagogic approaches. The unstructured nature of the interview gave a voice to the story of each ECD centre's development and how the centre fit into its context. I used some prompts to steer the discussions within the frame of the research problem, which considered the physical environment and its appropriateness as an ECD learning environment.

The interviews were transcribed to create a narrative for each participant. Each description was then analysed thematically in relation to the literature review and coded using a deductive approach. The codes identified represented the repeating topics covered by the participants. The relationships between the codes were identified, and the similar categories were grouped together. The categorised codes were then positioned as themes according to the four systems of the ecological systems theory, the theoretical framework used (Bronfenbrenner, 1979). The four themes were the macro, meso, micro, and chronosystems. I found the application of the ecological systems theory to be a common framework in the exploration of the quality of early childhood development and learning, both internationally and in South African research (Pillay, 2018; Munnik and Smith, 2019; van Liempd, Oudgenoeg-Paz and Leseman, 2019; O'Keeffe *et al*., 2022).

4.5 RESEARCH ETHICS, TRUSTWORTHYNESS, AND LIMITATIONS

The empirical work of this research investigated the learning environments of a selected group of ECD centres on the outskirts of Durban, KZN. The data collection included the participation of the women who managed the centres and teachers. The data collected using the architectural surveys, environmental quality evaluations, and classroom observations required no direct engagement with the occupants of the research sites.

Time was taken to gain access to each research site in accordance with the established research methodology protocols for environment-behaviour research (Lippman, 2010b; Gifford *et al.*, 2011) and the protocols from the University of KwaZulu-Natal, Humanities and Social Sciences Research Ethics Office. Access to the sites followed the provision of a detailed, non-technical, and clear explanation of the scope of the research, the different forms of data collection that were planned, and what would be expected of the participants. Participation was voluntary. As gatekeepers, the principal or manager of each of the ECD centres provided a letter giving permission for their centres to form part of the research project. A request for permission to conduct the research was submitted to the UKZN Humanities and Social Sciences Research Ethics Committee (HSSREC) – Protocol Reference Number: HSSREC/00001032/2020. The submission detailed the research project, the methodology, and the research instruments to be used. Permission was granted, with the aforementioned protocol reference number. The ethical clearance letters and samples of the gatekeepers' letters and informed consent forms appear in Appendix A. The adult participants signed the required informed consent letters, and child participation was limited to the pilot study, as discussed in Section 1.3.5. Parental consent and child assent were obtained for the pilot study.

Research in the educational context often includes observations of children in the natural setting of their classrooms or outdoor play areas. The study protocol does not require the inclusion of informed consent if the research does not require direct engagement with children. The combination of direct and indirect participation in the same study has been validated in recent studies (Jobb, 2019; Pulay and Williamson, 2019; Yizengaw and Tessega, 2020). This involves participants engaging directly in the research, e.g., by participating in interviews, as well as participants engaging indirectly, e.g., by being observed. This approach

concurs with the methodology of observation discussed by Sussman (2015); and Creswell (2012). Based on the preceding literature, my approach to the ethics of observation was that the children and teachers who were present during the classroom observations were not included as direct participants and were thus not required to provide consent.

The premise for avoiding the need for informed consent was to avoid 'reactivity', where the naturalistic setting is lost once the one being observed knows they will be observed and why they will be observed (Jupp, 2006; Sussman, 2015). Upon reflection of the observations, some reactivity did occur, and this was discussed in the detailed description of the observations. This awareness of the researcher could be seen as a limitation for the research; however, the number of classrooms observed provided a large enough data set. Furthermore, the focus of capturing how the children inhabited their learning environment and how the space and environmental characteristics supported or inhibited the activities would not be greatly impacted by the slightly different behaviour of some of the groups.

Qualitative research includes the interpretation of the data obtained and the establishment of the validity and trustworthiness of the data (Seamon and Gill, 2015). The subjectivity and multiplicity inherent in qualitative research through the interpretivist lens complicate the notion of the study and the data being reliable, as this stands in direct contrast to quantitative research that provides objective, singular, and mostly independent results (Groat and Wang, 2013). A more appropriate determinant of the quality of the research is the establishment of trustworthiness, which determines the appropriateness of the interpretation of the results, as well as the inclusion of triangulation and sensitivity (Seamon and Gill, 2015).

The transformative paradigm (Groat and Wang, 2013) determines the further parameters, namely: the diversity of the participants; the cultural sensitivity; the identification of potential benefits of the research; a reflection on the power differences between the participants and the researcher; and the identification of inequalities in terms of social and spatial justice. It was critical to include a range of research tools for data collection, considering the complexity of establishing the trustworthiness (reliability) of the data when using the qualitative approach, and more particularly when using the interpretive/transformative lens. The multi-layered approach to the research design provided data in appropriate forms for analysis. This

included some tools for the collection of objective aspects, such as the architectural and human comfort surveys that formed the basis for the more subjective data interpretations. The interviews provided the social/spatial justice lens required by the transformative paradigm and enabled the research aims and objectives to be reconsidered to effect change.

There was the potential for the research at all the sites in the low socio-economic area to be limited due to the language/cultural barrier of a white English-speaking researcher conducting research in an area where most participants were black isiZulu speakers. During the initial stages of introduction to the research sites, I had to gauge whether it would be necessary to have an interpreter present. During these initial visits, I was accompanied by the NGO representative, an African isiZulu speaking lady. Including her in the introductory meetings helped with the provision of explanations in isiZulu for clarity purposes. I found that most of the participants were fully conversant in English and thus opted not to include an interpreter in the data collection process. The participants' fluency in English may have been due to their constant engagement with and support from NGOs that were generally operated by English-speaking women. All the schools also included English as their medium of instruction.

The research data and findings were also greatly impacted, and therefore limited in certain ways, by the occurrence of the COVID-19 pandemic. The proposal for this research was approved in 2019, before any conception of the COVID-19 pandemic existed. The impact of the extended lockdown restrictions on the ECD sector was devastating (Wills *et al.*, 2021). The majority of the ECD centres were closed for several months, and when they were finally re-opened, the number of children in attendance was very low. The day-to-day life in the pre-schools looked very different from it was before the pandemic. The restrictions placed on them by implementing sanitation protocols and social distancing guidelines were visible at each research site. In some instances, children could no longer use the outdoor equipment as the school did not have enough sanitising spray to follow the required protocols. A further primary concern was the restriction of 'free play' and play on some of the usual play equipment. The children's movement and sharing of toys and learning equipment were restricted in most of the ECD centres. The research design could not accommodate an assessment of the impact of these restrictions, so I had to work with what was presented at the time of data collection. I did, however, include a category for COVID-19 on the physical

environment investigation datasheets. The interviewees all mentioned the change in the learning environment due to the restrictions posed by COVID-19.

Notwithstanding, the data collection, analysis, and findings are rooted in established methodologies and theories that provide a rigorous body of work that collectively achieves the aims and objectives of the study.

4.6 CONCLUSION

In this chapter, methodological positioning, research approach, and research design were discussed in relation to the research problem dealing with the inequalities in the learning environments for early learning in South Africa. The research is rooted in interpretivism as an acknowledgement of the multiple understandings of reality in the ECD sector of the country. The use of the rights-based theoretical lens, the social and spatial justice lens, and the lens of a transformative paradigm became relevant.

The collective or multi-case study research design includes a collection of ECD centres as the research sites, which were investigated using a range of methodologies established through the review of learning environment and educational research (see Chapter Two) that combined some of the traditional evaluative methods such as architectural surveys, environmental evaluations, and observations with the constructivist approaches of interviews as a form of participation to provide the participants with a voice. The choice of multiple methodological approaches was approached as complementary modes of investigation, resulting in a deeper understanding of the phenomenon being studied. The combination has elucidated the complexity of the ECD centres as embodied spaces. This is extended through the data analysis, which is framed through the theoretical lenses of phenomenology, ecological systems theory, and seeking justice. Ethical processes were carefully considered, and the limitations of the study are acknowledged.

The next chapter (Chapter Five) introduces the collective case study in the context of early childhood development in South Africa, and this is followed by the presentation and analysis of the data (Chapter Six).

5. CHAPTER FIVE – CASE STUDIES

5.1 INTRODUCTION

The research explores the relationship between early childhood development (ECD) learning environments and the transformation of ECD in South Africa. This chapter introduces the background of each case study, allowing a better understanding of the context, site, building form, and type of each ECD centre. The range of facilities and levels of quality of each ECD learning environment are established by this discussion. Lastly, the chapter provides an overview of the ECD sector in relation to childcare and preschool provision in South Africa and positions the case study sites within the macro context of early childhood development in South Africa.

The chapter is structured to first introduce the recent data relating to early childhood development centres at the national, provincial, and municipal levels. It further identifies the influences of context at the macro, meso, and micro socio-ecological levels, in line with the theoretical frame discussed in Section 3.3. Extracts from the interviews with the participants are included to deepen the understanding.

5.2 ECD CENTRES IN SOUTH AFRICA

The *National Integrated Early Childhood Development Policy* (Department of Social Development, 2015) defines ECD programmes to include forms of daily care and development and provide early learning opportunities. The range of offerings includes:

- Community-based play groups with specific operating hours.
- Household-level interventions that provide outreach and support programmes for young children and their families.
- Support and enrichment programmes for parents.
- Psychological support for young children and their families.
- Child and youth care and partial care facilities offering ECD programmes.

- Any other programmes that provide care, development, and early learning to children from birth until they enter school.

An ECD centre is defined as "a partial care facility that provides an early childhood programme with an early learning and development focus for children from birth until the year before they enter Grade R/formal school" (Department of Social Development, 2015, p. 11).

In South Africa, there are a large variety of types of ECD centres. According to the UNESCO Global ECD Monitoring Report on South Africa (UNESCO, 2007), the majority of ECD programmes are offered by the private/home/community sectors. The role of NGOs and faith-based and community organisations thus remains critical. The report indicates that institution-based ECD centres are either public or independent. The Provincial Department of Education funds public ECD institutions through pre-primary schools that provide care and education for children from 3 to 5 years of age. According to the White Paper on Early Childhood Education (DoE, 2001), independent ECD centres receive minimal funding from the government and rely on fees from parents, community fundraising, and the donations of materials. The range of independent ECD centres is much broader than the public ones and can include:

- The reception year (Grade R) at independent schools.
- The reception year (Grade R) attached to public schools but managed by the school's governing body and operated by a private individual or the community.
- Independent pre-primary schools for children of 3-5 years of age.
- Privately operated or community-run crèches or nursery schools for children under five years of age.
- Home-based provision for children under five years of age.

However, since the early 2000s and since Education White Paper 5 was published in 2005, there has been an increase in the number of ECD programmes provided as part of the national transformation agenda, specifically targeting disadvantaged communities. The role of NGOs in the scaling-up of ECD centres is critical, as they partner with communities and ECD providers to upgrade existing pre-schools and crèches in the following ways:

- Upgrade existing centres to become sustainable businesses through support mentoring and training.
- Assist with registration with the Department of Social Development (now the Department of Basic Education).
- Improve the quality of early learning through the provision of educational materials.
- Provide ECD teacher training.
- Monitor and provide nutrition.
- Improve existing facilities or build new facilities.

The nationwide audit of ECD provision conducted in 2001 (Williams and Samuels, 2001) provides an overview of the ECD sector in South Africa and highlights the vast inequalities and lack of provisions. The report indicates a total number of 23,482 ECD centres across the country. The most recent ECD census conducted in 2021 (Department of Basic Education, 2022b) provides the most complete review of the ECD sector in South Africa. The findings indicate a total of 42420 early learning programmes in South Africa, which is a vast improvement and double the number that was reported in 2001. However, the more detailed report on the status of 4-5-year-old children attending ECD learning programmes indicates that less than half are on track to reach their learning potential (Thrive By Five, 2022).

Focusing on the provincial context of this research, Fig. 5.1 illustrates the distribution of ECD centres per province, with 8089 ECD programmes located in KwaZulu-Natal (KZN). However, the 0-6 child population has historically been the highest in KZN, with Gauteng only recently reaching a higher number. The 2019 South African early childhood review reports that KZN has the highest poverty rate, with 78 per cent of 0-6-year-old children living in poverty (Hall *et al.*, 2019). It is therefore critical to compare the number of sites to the enrolment figures.

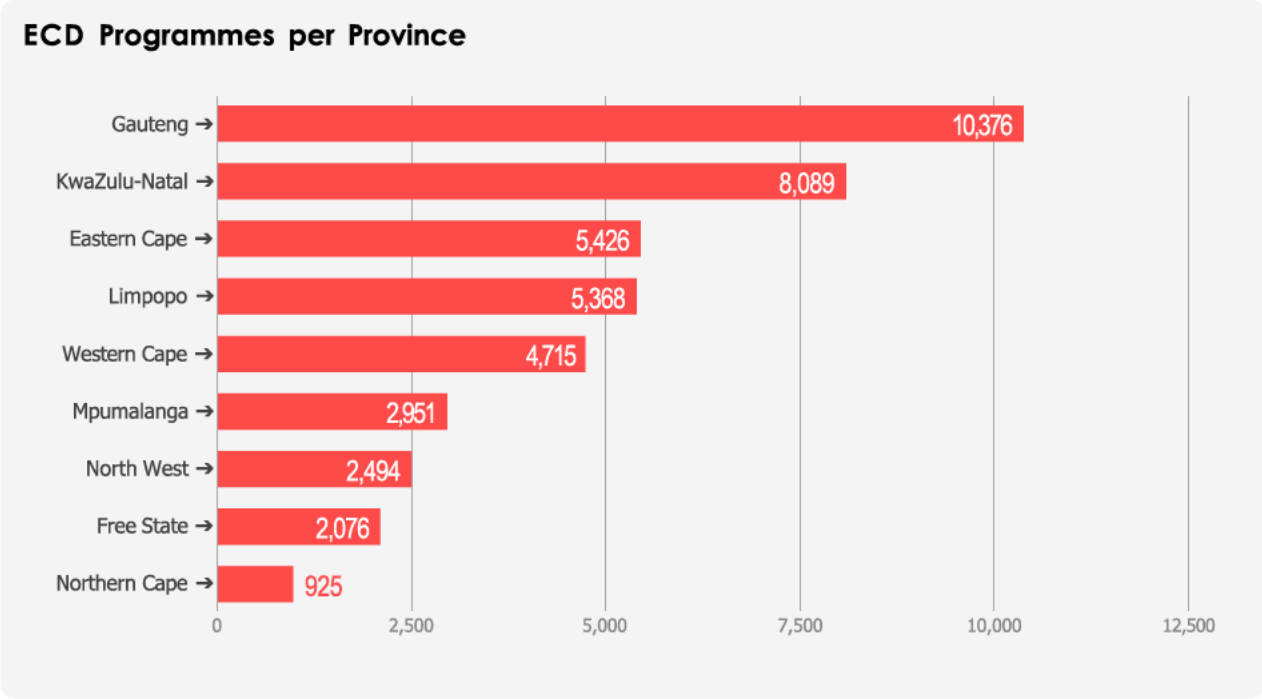

Figure 5-1 ECD Programmes per Province

Source: Hall *et al.* (2019)

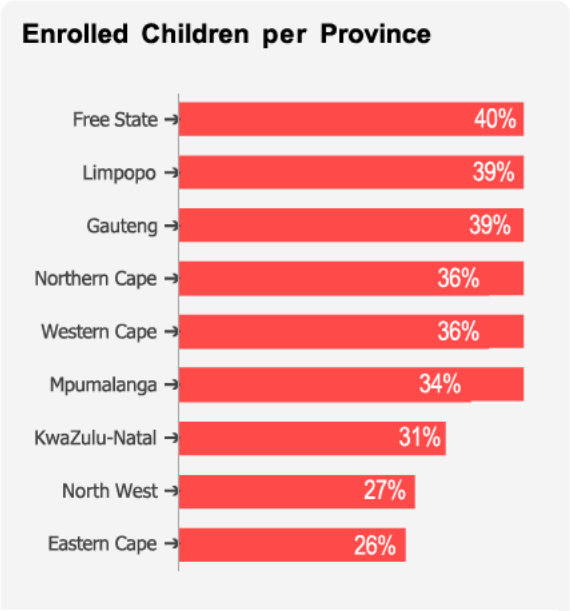

Figure 5-2 Enrolled Children per Province

Source: Hall *et al.* (2019)

The percentage of enrolled children illustrated in Fig. 5.2 indicates that only 31 per cent of the children under five in KZN are benefitting from ECD programmes. The audit further identifies the context of these ECD programmes as being spread across urban (60%) and rural (40%) settings. The low percentage of children benefitting from the ECD programmes has a direct relationship to the high level of poverty and large rural communities found in KwaZulu-Natal in comparison to other provinces such as Gauteng (Hall *et al.,* 2019).

The ECD audit (Department of Basic Education, 2022b) should be read in relation to the macro context of the COVID-19 pandemic, which severely impacted enrolment throughout South Africa. The ECD audit information collected during 2021 reported lower attendance than the 2019 records. A similar trend emerged during the exploration of eight case study sites located in the eThekwini Municipality, with data collected during 2020.

The ECD audit indicates that the enrolment percentage versus child (age 0-5) population by municipality for eThekwini is low (17% - 25%); however, more detail of the status of the ECD centres in eThekwini is not forthcoming, indicating the need for more research focused on the provincial and municipal levels.

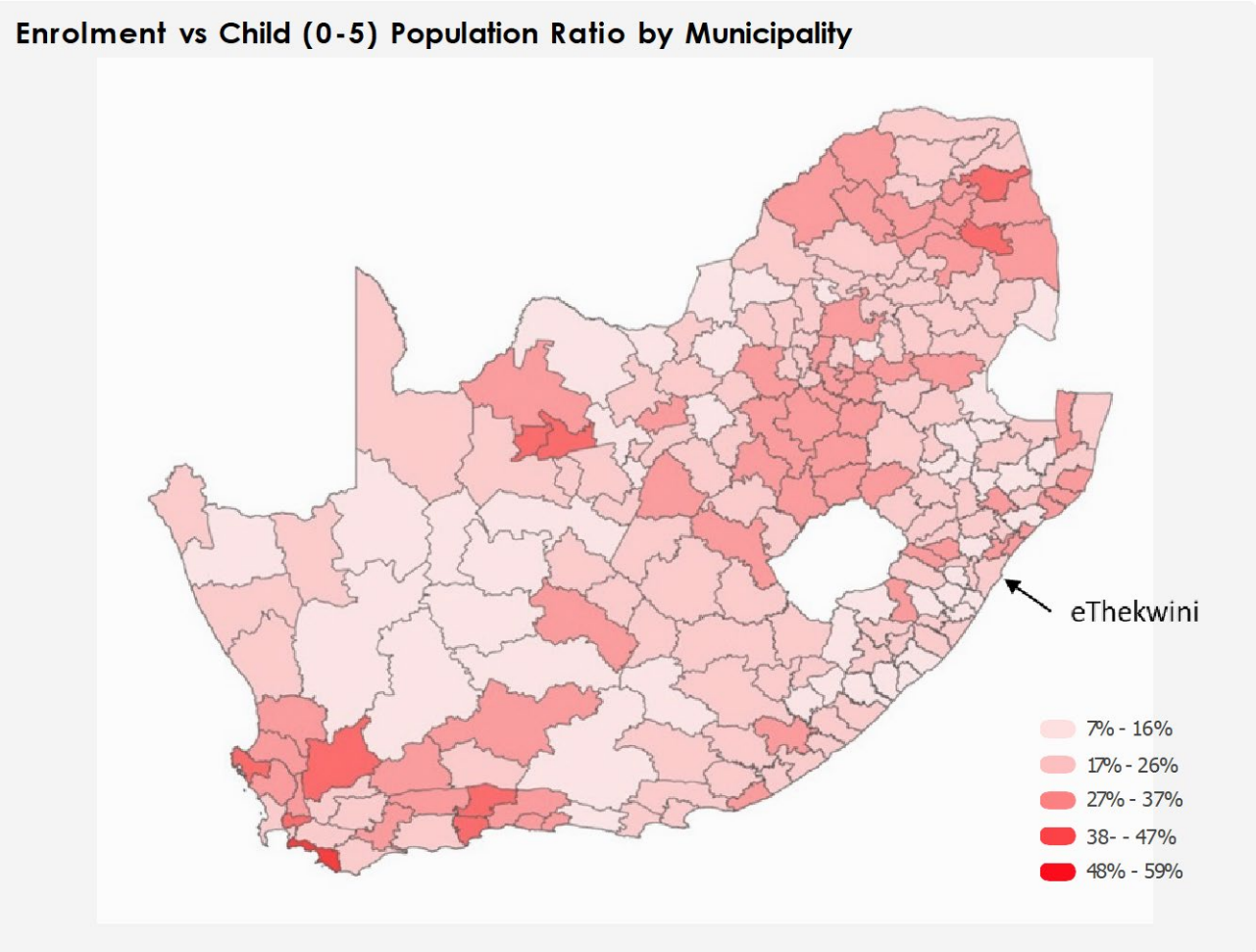

Figure 5-3 Enrolment vs Child (0 – 5) Population Ratio by Municipality

Source: Department of Basic Education (2022b)

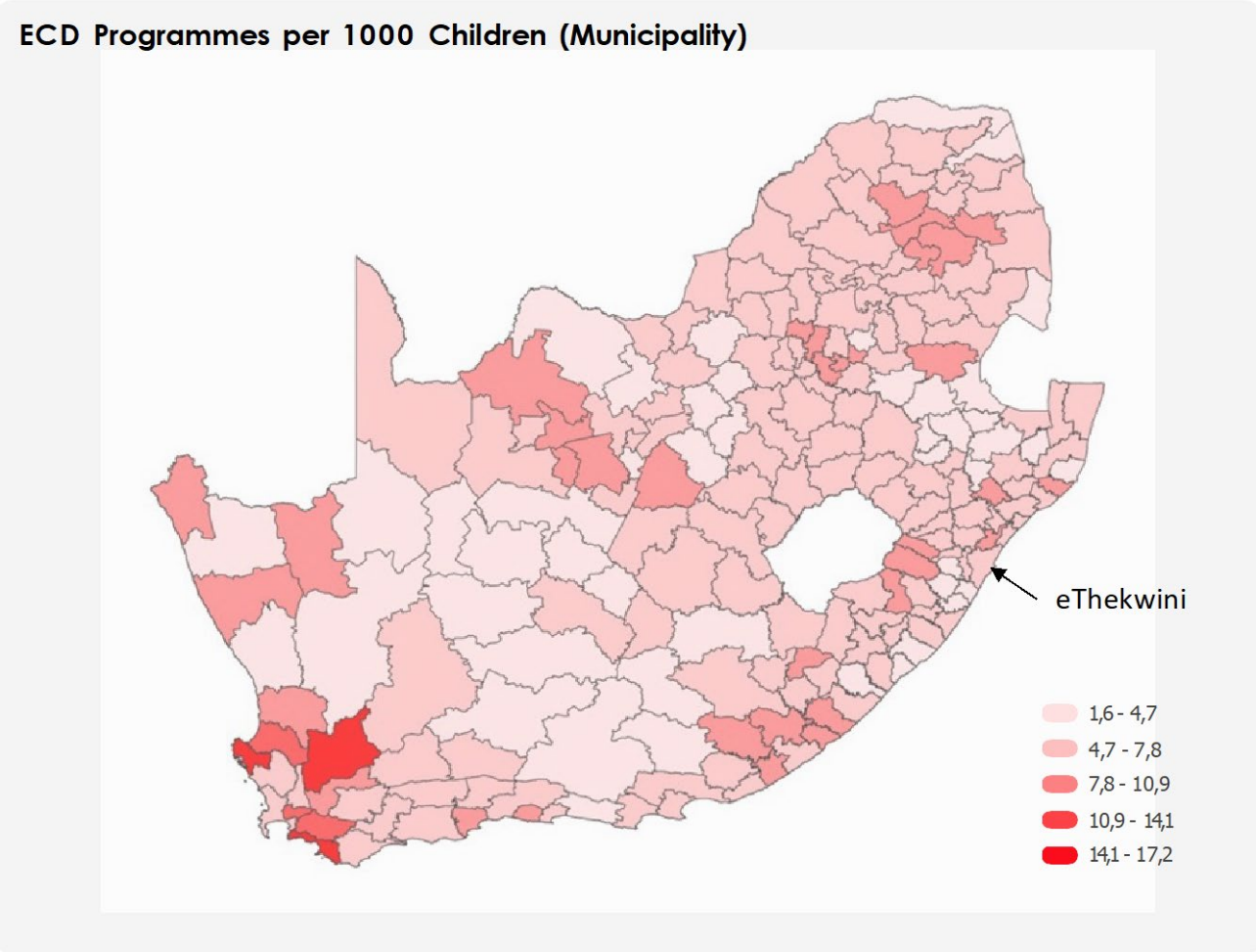

Figure 5-4 ECD Programmes per 1000 Children

Source: Department of Basic Education (2022b)

The findings shown in Fig. 5-4 indicate that there is a severe shortage of ECD centres in relation to the population of young children in eThekwini. This shortage seems to be spread across most of the country, with only a handful of municipalities in the Western Cape providing adequate numbers of centres (Fig. 5-3).

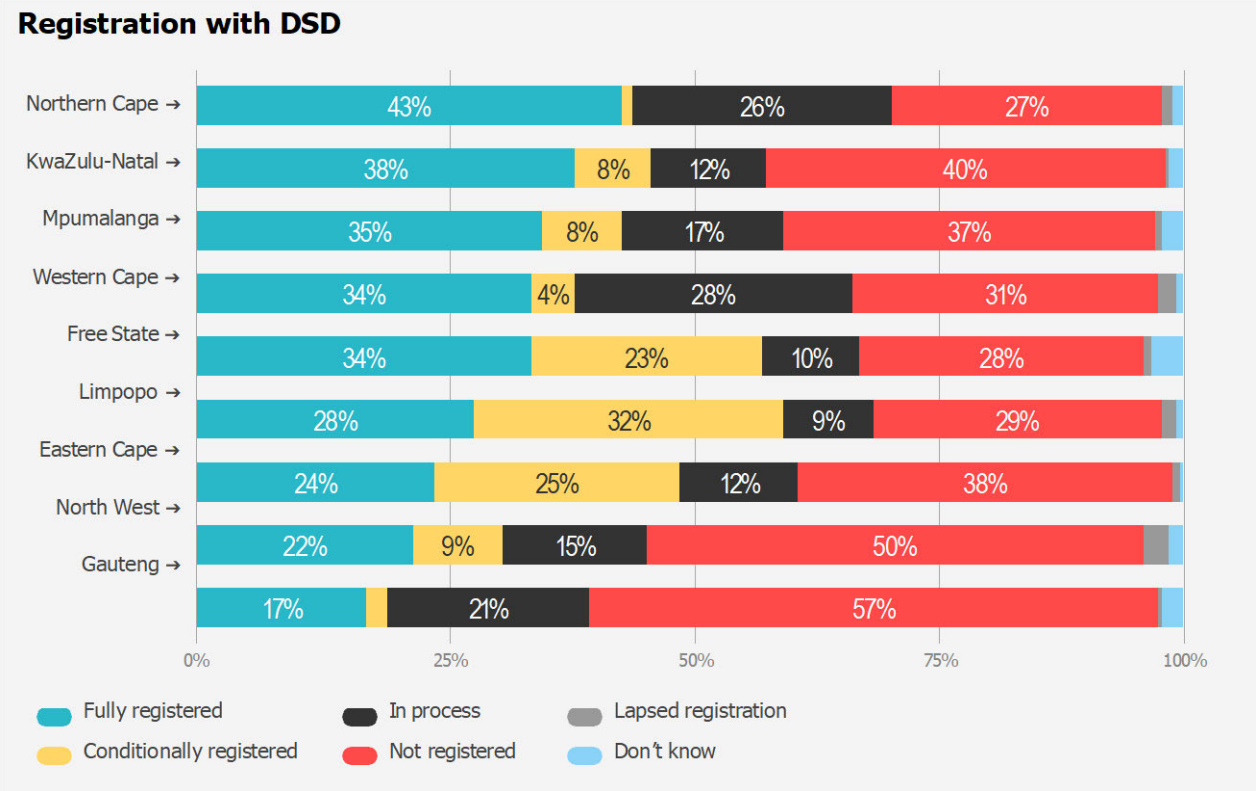

Figure 5-5 Registration with the DSD

Source: Department of Basic Education (2022b)

The background of the status of the ECD centres in the context of South Africa forms the background for the research and positions the collection of case study sites to represent a small percentage of the registered (with DSD) centres within the context of the Outer-West region of eThekwini. The next section will present the case study area, the details of each site, and provide the basis for reading the findings presented in Chapter Six.

5.3 ECD CENTRE CASE STUDY COLLECTION

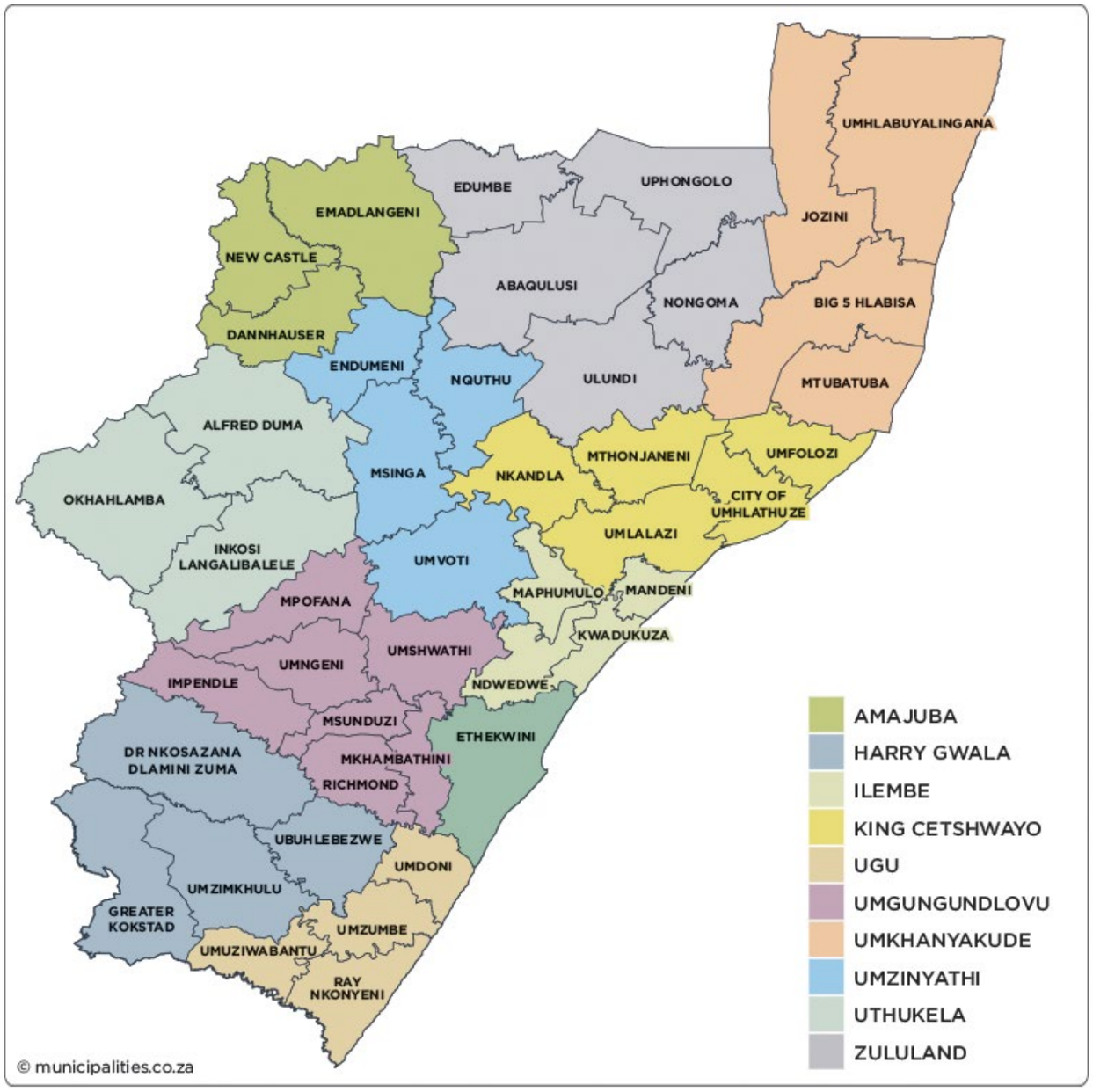

Figure 5-6 Map of KwaZulu-Natal municipalities
Source: https://municipalities.co.za/provinces/view/4/kwazulu-natal (2024)

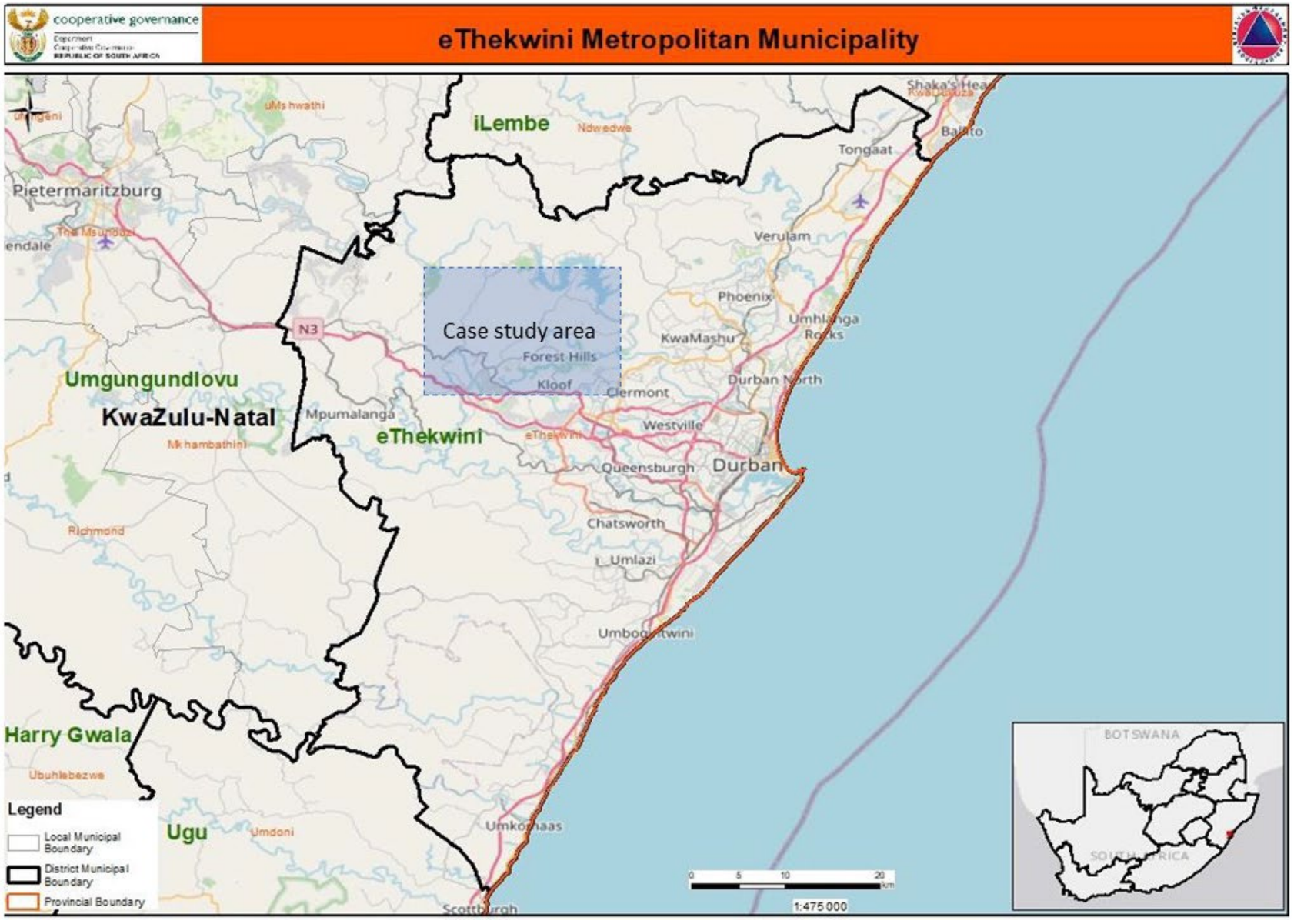

Figure 5-7 Map of eThekwini with case study area indicated
Source: Adapted from https://www.durban.gov.za/pages/government/about-ethekwini (2024)

Figure 5-8 Case study sites location

Source: Google Earth (2021) (https://earth.google.com/)

The collection of eight case studies situated in the province of KwaZulu-Natal in the municipality of eThekwini as illustrated in Fig. 5-6, 5-7 and 5-8 was selected to represent some of the diversity that is found throughout the provinces and municipalities of South Africa. The sites are all located in the Outer-West region of eThekwini (Durban) and comprise two pre-schools representative of a high socio-economic context and six smaller centres representative of a low socio-economic context. The sites all represent different building forms, scales, building ages, and conditions of infrastructure. The centres are all privately owned, either by private individuals, families, or church organisations. The centres were all confirmed to be registered with the Department of Social Development at the time of the data collection, indicating that all the sites meet the minimum norms and standards in terms of health and safety as set out by the Department of Social Development (2006) and in compliance with the local authority's requirements.

However, the quality of the learning environments represented in the collection of eight research sites varies when viewed through the conceptual lens of responsiveness, as discussed in Chapter Two, Section 2.3.2. The research sites further represent varying approaches to or acknowledgement of the concept of the learning environment as a third teacher, as discussed in Chapter Three, Section 3.2.3.

The interpretivist approach to the project and thus this presentation of the research sites allows the reader to view the sites through my experience and representation, combined with quotations from the interviews with the participants from the sites as a layer of co-construction (Mitchell, 2011; Creswell and Creswell, 2018). I have included the factual information from each site, along with a contextual map, a floor plan, and a selection of photographs to provide snapshots of each site. As an extension of the phenomenological construct, I include a description of my experiences and impressions of the sites.

Using the lens of spatial justice (unpacked in Chapter Three, Section 3.4.3), it is evident in the range of learning environments presented that the transformation of early childhood development has been inconsistent.

5.3.1 Site E1

This ECD centre is family-owned and headed by a very passionate elderly woman. The buildings are modest and include a series of structures nestled in a community on all the buildable land in an otherwise steeply sloped landscape. The atmosphere is child-friendly, as the buildings have a domestic scale and include hints of colour. The covered area in front of the two classrooms provides a protective in-between space. The centre includes reception (Gr. R) and foundation phase children. Although the older children are accommodated in a separate classroom, they use the same ablutions that are only accessible from inside the pre-school classrooms. The centre is expanding to accommodate the needs of its surrounding community for quality education, but this is at the cost of providing a quality learning environment specific for younger children aged two to five years.

Principal: "*I was just looking for the quality education, because when I was exposed to ECD, I was taken and then it was my first time to see that. How children can be taught like this at any stage? And you can have this? They have the separate classrooms. Because at that time it was so hard. Our situation in the area was so hard. It was terrible, because children were playing outside and the ECD centres were just those old grannies just bringing children. Just looking after them*".

Table 5-1 Site E1 Summary of the Background and Context

Established	2004
No. of Children	65
Age Range	0 - 6 and Grades 1 - 3
Land Ownership	Owned by the family of the principal
Buildings	Started in the church building Main classroom block constructed in 2007 Funded and constructed by NGO donations
Context	Peri-urban/rural area with traditional land ownership
Community	Small church building on the same site and neighbouring houses of family members
Registration Status	Registered – receiving grants
NGO Involvement	Supported by 3 NGOs to provide learning material, educational planning, and teacher training

Table Source: Author (2022)

Figure 5-9 Main classroom block

Figure 5-10 Outdoor play areas with stairs

Source of the Figures: Author (2020)

Figure 5-11 Map of Site E1

Source of the Figure: Google Earth (2021) (https://earth.google.com/)

Figure 5-12 GIS Map of Site E1 with floor layout

Source of the Figure: Adapted from eThekwini Municipality Corporate GIS Map Viewer (2020) (https://gis.durban.gov.za/cmv-cgis/viewer/?config=cgisPublicViewer)

5.3.2 Site E2

On arrival, the ECD centre reads as child-friendly, with its domestic scale and colourful walls providing a sense of place. The entrance is a little obscured. The centre is spread over two terraces linked by stone retaining walls and uneven steps built into the very steep terrain. The first building is a converted home with a random arrangement of rooms and a recently added first-floor classroom. Part of the building provides a residence for the principle. The lower-level building consists of a sizeable hall internally partitioned into two classrooms. The outdoor play area includes different types of climbing equipment. The presence of nature is very strong on the site. The ablutions of the centre are in very poor condition, to the point where it seems doubtful if health and safety requirements are being met. However, the learning spaces are decorated with care and show an understanding of the notion of the third teacher. The principle has a good understanding of the value of ECD and is passionate about her role.

Principal: "*It was 2002, I was doing, I was at matric, and I fell pregnant. I was a teenager. So, my pastor's wife, my mum, I call her my mum, but she's my pastor's wife, she decided to open this crèche because she wants me to go back to school, because in my home, there was no one who'll look after my baby. And she decided to open this crèche, it was 2002 October*".

Table 5-2 Site E2: Summary of the Background and Context

Established	2002
No of Children	120
Age Range	0 to 6
Land Ownership	Owned by the foster parents of the principal
Buildings	Funded and constructed by a church organisation from Johannesburg
Context	Peri-urban/rural area with traditional land ownership
Community	Established by and receiving continued support from the founders and the church organisation. The principal lives in accommodation that forms part of one of the classroom blocks. The large classrooms at the bottom of the site were previously used for church services
Registration Status	Registered – receiving grants
NGO involvement	Supported by one NGO for teacher training. Learning materials and educational planning are supplied by the church organisation

Source of Table: Author (2022)

Figure 5-13 Main Classroom Block

Figure 5-14 Outdoor Play Area

Source of the Figures: Cloete (2020)

Figure 5-15 Context Map of Site E2

Source of the figures: Author; Google Earth (2021) (https://earth.google.com/)

Figure 5-16 GIS Map of Site E2 with floor layout

Source of the Figure: Adapted from eThekwini Municipality Corporate GIS Map Viewer (2020) (https://gis.durban.gov.za/cmv-cgis/viewer/?config=cgisPublicViewer)

5.3.3 Site E3

The centre is situated in an area that reads as a commercial node. To access the site, one passes through a taxi rank and wash area off a main road. The ECD consists of a stand-alone hall-type building. The site has a gentle slope with views over the surrounding areas. The simple structure contains an open plan classroom with low-level walls to create three learning spaces. The building needs maintenance as the plaster and paint are peeling, and the character reads of neglect. The learning environment, although colourful, is overwhelmed by a high number of children and the combination of age groups in one space. The outdoor play equipment is in need of repair. Some of it is inaccessible as it is broken. The natural setting and garden provide some sense of place, but the neglect limits the potential of the belonging. This site indicates some of the limitations in terms of spatial justice and transformation.

Table 5-3 SITE E3: Summary of the Background and Context

Established	Unknown*
No of Children	52
Age Range	0 to 5
Land Ownership	Unknown*
Buildings	Unknown*
Context	Peri-urban/rural area with traditional land ownership
Community	Context maps show a community hall on the adjacent site, but no relationship was reported. Principals and staff do not live near the school.
Registration Status	Registered – receiving grants
NGO involvement	Supported by 2 NGOs for teacher training and learning materials.

Source of Table: Author (2022)

* The principal and her assistant were not available during the fieldwork to provide more insight into the background of the research site.

Figure 5-17 Classroom Block

Figure 5-18 Outdoor area

Source of the Figures: Cloete (2020)

Figure 5-19 Context Map of Site E3
Source of the figures: Author; Google Earth (2021) (https://earth.google.com/)

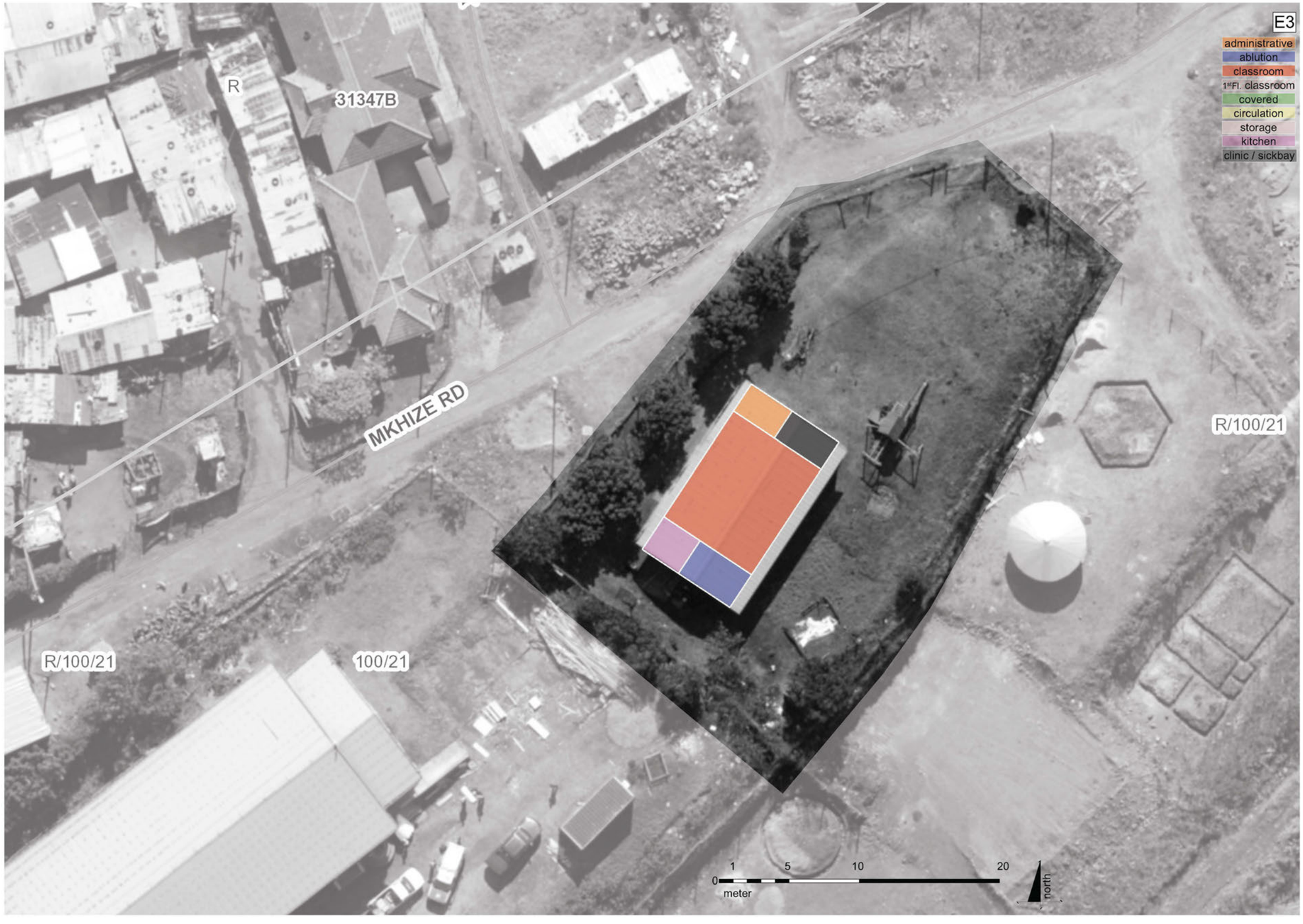

Figure 5-20 GIS Map of Site E2 with floor layout

Source: Adapted from eThekwini Municipality Corporate GIS Map Viewer (2020) (https://gis.durban.gov.za/cmv-cgis/viewer/?config=cgisPublicViewer)

5.3.4 Site E4

The centre looks well established, with a boundary wall, prominent signage, and a secure gate. The main building is on the edge of a road. The grey colour scheme gives a slight institutional character to the place. The main building provides a spacious open-plan learning space, which is divided into four learning areas with low-level moveable partitions. When all the children are present, that space becomes full of life but is also noisy. The outdoor area includes a sloping grassed area with play equipment. A recent addition is a small timber hut to accommodate the grade R class. The building and outdoor play area provide open views of the surrounding valley. The buildings and outdoor areas are in good condition, giving a sense of pride in the place. Although the principal has no training in ECD, she is actively working towards transformation by recruiting qualified teachers and improving the learning environment.

Principal: "*The reason I'm doing ECD because this was, my mum was the founder of the crèche. So, mum, she's old and we sit down together with the family. They said because my mum she's old, I need to just take over and run the business. So, I started here. So, I think I've got four years now. Because my mum, she started the crèche; it was 1994 and she started at one of the churches, and then after that they were at the garage, and then after that they moved down here. So, I took time. It was five years ago, if I'm not mistaken. That's why I have to be a part of the ECD. Because of my mum*".

Table 5-4 Site E4 Summary of the Background and Context

Established	1994
No of Children	50
Age Range	0 to 6
Land Ownership	Owned by the family of the principal
Buildings	Funded and constructed by donations
Context	Peri-urban/rural area with traditional land ownership
Community	Established by the mother of the Principal. The family home is adjacent to the centre, with large vegetable gardens.
Registration Status	Registered – receiving grants
NGO involvement	Supported by two NGOs for teacher training, learning materials, and educational planning

Source of Table: Cloete (2022)

Figure 5-210 View of the Main Learning Space

Figure 5-221 Play Area and Timber Classrooms

Source of the figures: Cloete (2020)

Figure 5-232 Context Map of Site E4

Source of the figure: Author; Google Earth (2021) (https://earth.google.com/)

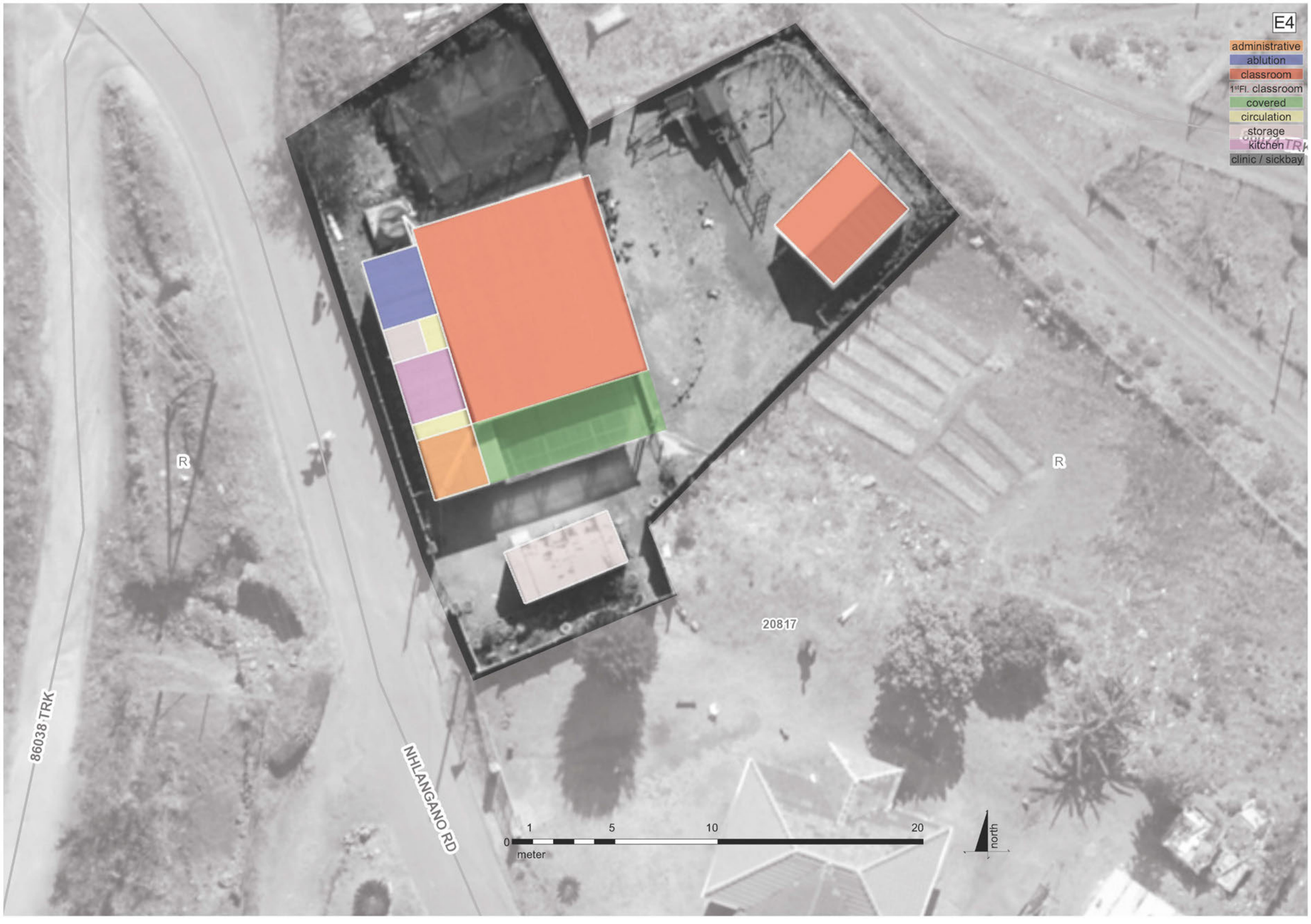

Figure 5-243 GIS Map of Site E4 with floor layout

Source: Adapted from eThekwini Municipality Corporate GIS Map Viewer (2020) (https://gis.durban.gov.za/cmv-cgis/viewer/?config=cgisPublicViewer)

5.3.5 Site E5

On arrival the ECD centre has a distinctive sense of place, with a large tree and a distinctive bright green colour scheme. Three large learning spaces and a spacious outdoor area provide a relatively good opportunity for quality ECD. However, the building is an assemblage of additions over time, with some of the structure showing deterioration as it has the original traditionally built mud and timber walls. The care and dedication of the staff and principal are evident throughout the centre and they are all consciously working towards the transformation of children. However, their efforts are undermined by the unresponsive learning environment, with the only ablutions positioned in a separate structure. The building over-heats during the hot summer months, despite investment in ceilings with recent funding.

Principal: "*This centre was started by my mum, who was a community headworker in 90s. She saw the parents' houses, when if she goes around, she found children playing with mud and soil…. So that first building was built by the community. They dug here, that was before big bushes. They cut the bushes, they cut everything. They dug. They dug, they dug, they dug. They build with mud, soil, stones, poles, fence…. This crèche, this first aid is together things that my mum started in 1992*".

Table 5-5 Site E5: Summary of the Background and Context

Established	1992
No of Children	69
Age Range	0 to 5
Land Ownership	Owned by the centre, as the land was given to the founder by the traditional leader, who is the mother of the principal. It was given so that she could establish an ECD centre and clinic in the community.
Buildings	Funded by donations. Construction of the buildings was done with donations by the community and other donors over time.
Context	Peri-urban/rural area with traditional land ownership
Community	Established by Mother of the principal. The building includes a community health clinic.
Registration Status	Registered – receiving grants
NGO involvement	Supported by 2 NGOs for teacher training, learning materials, and educational planning.

Source of table: Cloete(2022)

Figure 5-254 Garden and learning spaces

Figure 5-265 Entrance Area and Clinic

Sources: Author (2020)

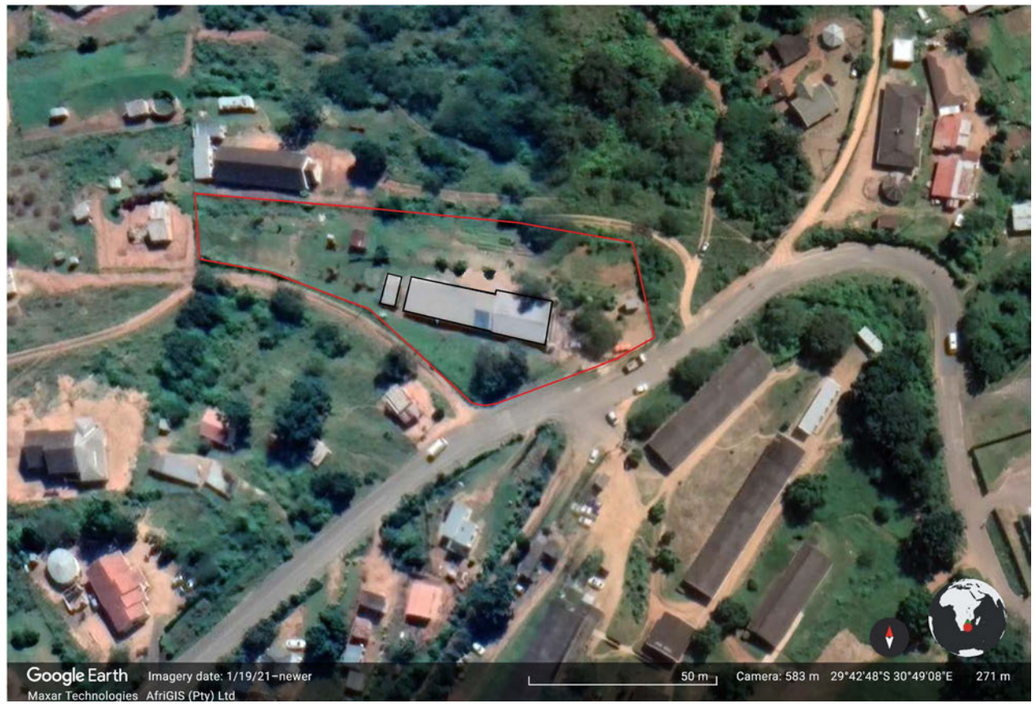

Figure 5-276 Context Map of Site E5
Source: Author; Google Earth (2021) (https://earth.google.com/)

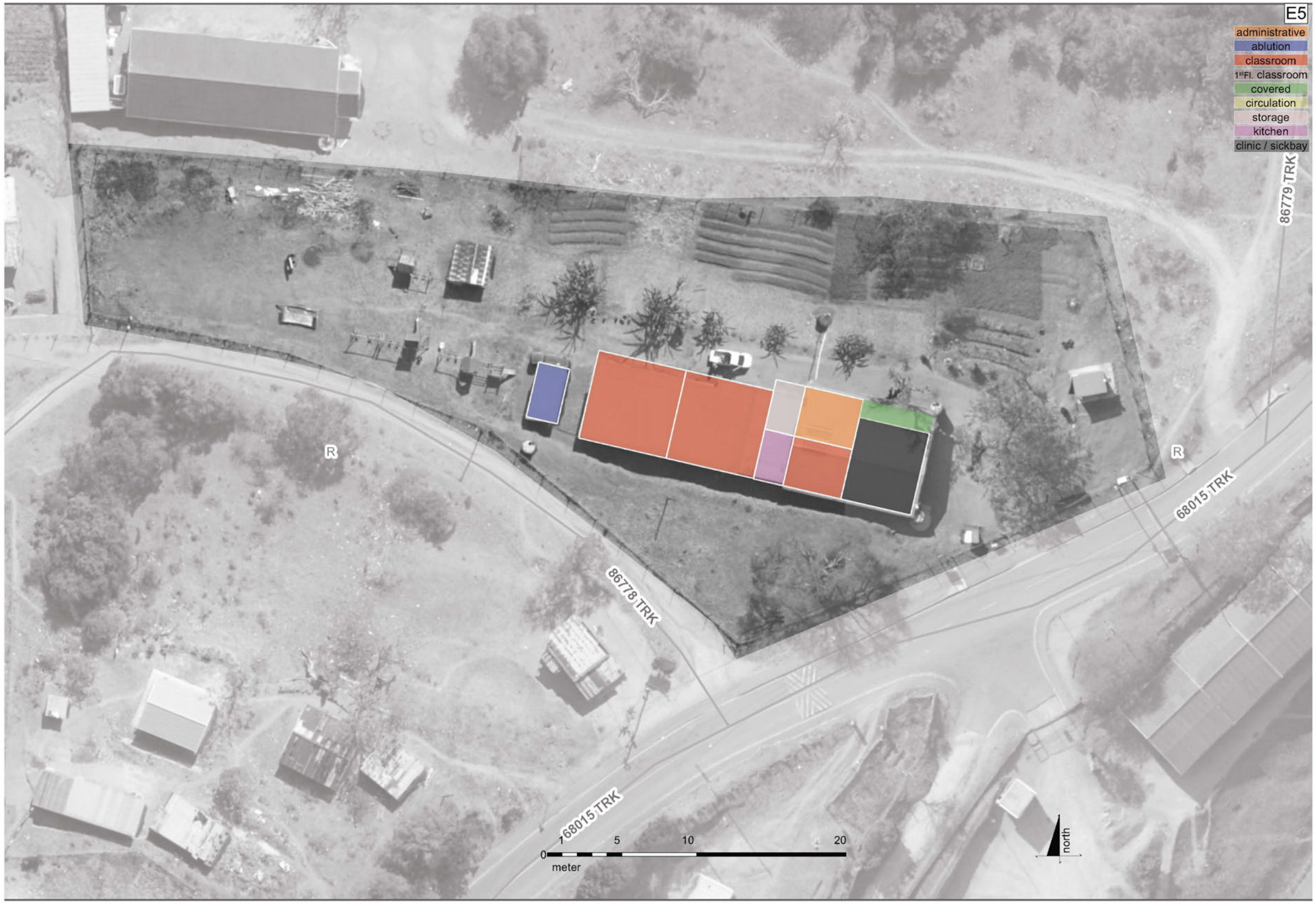

Figure 5-287 GIS Map of Site E4 with floor layout

Source: Adapted from eThekwini Municipality Corporate GIS Map Viewer (2020) (https://gis.durban.gov.za/cmv-cgis/viewer/?config=cgisPublicViewer)

5.3.6 Site E6

This newly constructed centre, with its colourful exterior and well-maintained site, has a strong presence in its community. The new building replaced what appears to have been a completely overcrowded and unsuitable space. The intervention was made possible by an NGO actively working towards spatial justice that sourced professionals and various corporate donations. The process facilitated by the NGO enabled the principal and teachers to become part of the process through presentations and discussions before the project started. The new structure provides a child-friendly atmosphere that supports the concept of the third teacher and follows responsive design principles that consider the climatic and geographic context as well as the unique needs of the children and staff. The school is, however, limited by a very small site that provides almost no natural outdoor play space. Notwithstanding, the ECD centre is an example of the potential inherent in good quality, responsive ECD learning environments.

Table 5-6 Site E6: Summary of the Background and Context	
Established	Unknown*
No of Children	37
Age Range	0 to 5
Land Ownership	Owned by the principal and a church.
Buildings	Funded by donations arranged by an NGO.
Context	Peri-urban/rural area with traditional land ownership.
Community	Established by the principal, who is also a pastor in the small church on the site. Family home and small church on site.
Registration Status	Achieved registration after completion of the new buildings and is receiving grants.
NGO involvement	Supported by 2 NGOs for teacher training, learning materials, and educational planning, as well as the new building.

* The principal was not available during the fieldwork to provide more insight into the background of the research site. One of the teachers provided some details.

Table Source: Cloete (2022)

Figure 5-28 View of the Centre from the Entrance

Figure 5-29 View of the Outdoor Play Area

Sources: Author 2020)

Figure 5-290 Context Map of Site E6

Figure Sources: Google Earth (2021) (https://earth.google.com/)

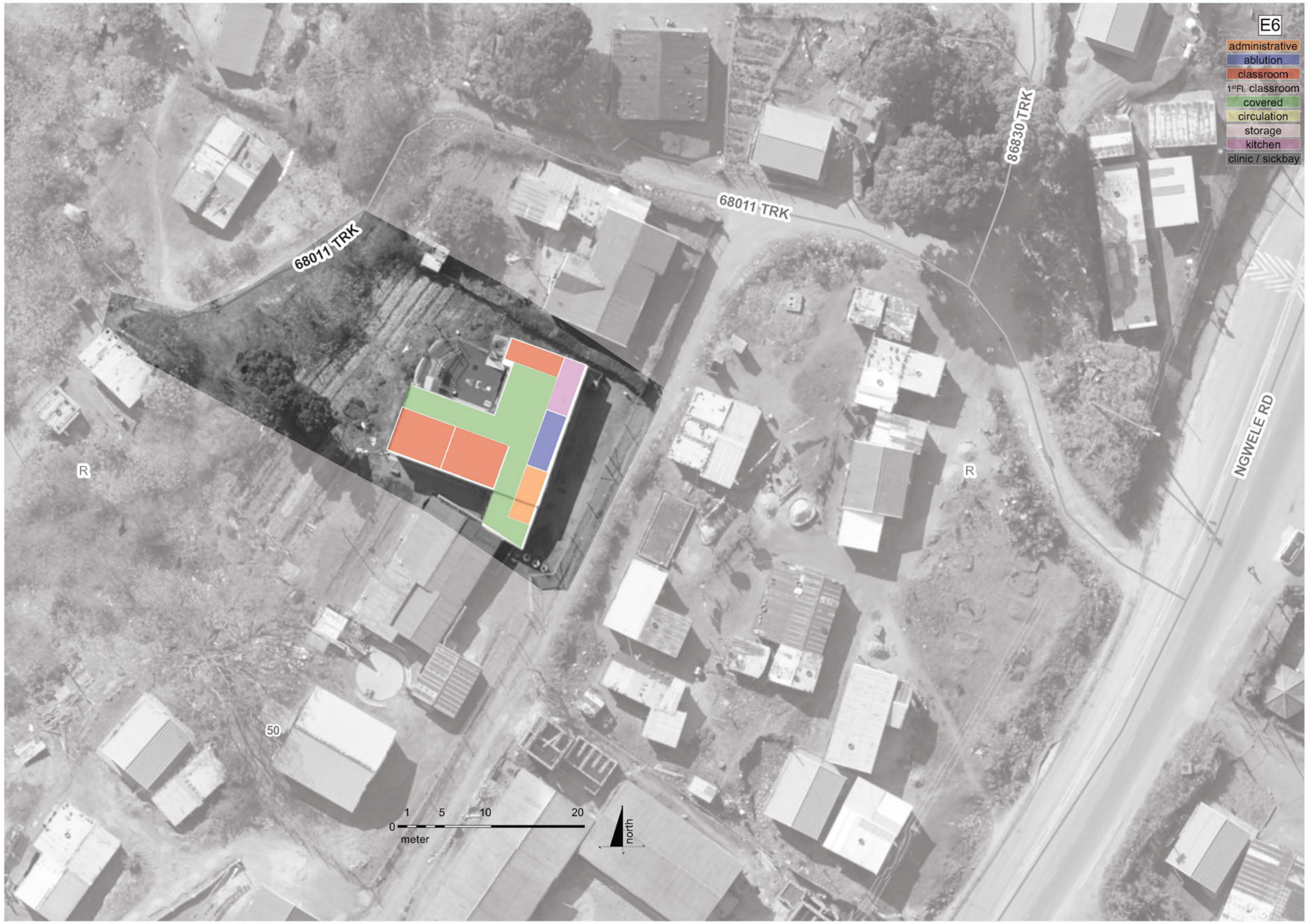

Figure 5-301 GIS Map of Site E6 with floor layout

Source: Adapted from eThekwini Municipality Corporate GIS Map Viewer (2020) (https://gis.durban.gov.za/cmv-cgis/viewer/?config=cgisPublicViewer)

5.3.7 Site H1

The centre forms part of a new campus that includes a primary and a high school, as well as the office of the NGO that works with the ECD in the low socio-economic area. The campus is set in a park-like landscape. The ECD centre is accommodated in a new purposely designed building. The classrooms are very spacious and have high ceilings, a storeroom, and ablutions. The layout follows the traditional U-shaped plan to enable a protective play area. The interior of the classrooms is colourful and represents many characteristics of quality learning environments. Although the architectural design includes many qualities and features that promote quality ECD, the occupants had to request several changes to ensure that a more responsive learning environment is achieved. One of the critical issues still unresolved is that the classrooms have no openable windows to enable natural ventilation. The principal and teachers are passionate about their roles in the lives of the children and provide child-centred learning with a curriculum that includes play. The centre is representative of what quality ECD can provide.

"*So, I started out with that. Pre-primary littlies are definitely where my heart is. So, I've been at this school for 18 years…. He (new owner) bought it with the equipment and everything and all of the staff, and so we kind of just moved here and so it was already the plans that had been drawn up and they had already started building. … … Watch it from foundation being built, but these plans actually came from America*".

Table 5-7 Site H1: Summary of the Background and Context	
Established	Unknown*
No of Children	150
Age Range	0 to 5
Land Ownership	Owned by a Private Company.
Buildings	Funded and Constructed by the Private Company that bought an established ECD centre and provided new premises.
Context	Peri-Urban/rural area complies with Town Planning scheme as educational zoning.
Community	Established by a former principal. The Private Company bought the school and provided the new buildings. The school is located on a campus that includes a primary and secondary school as well as NGO offices.
Registration Status	Registered – fee paying and does not receive grants.
NGO involvement	Children from the E1 to 6 sites are funded to attend this school and follow through until matric.

Source: Cloete (2022)

Figure 5-312 View of the Centre from the Car Park

Figure 5-323 Outdoor Play Area in the Courtyard

Source of Figures: Author (2020)

Figure 5-334 Context Map of Site H1
Figure Sources: Google Earth (2021) (https://earth.google.com/)

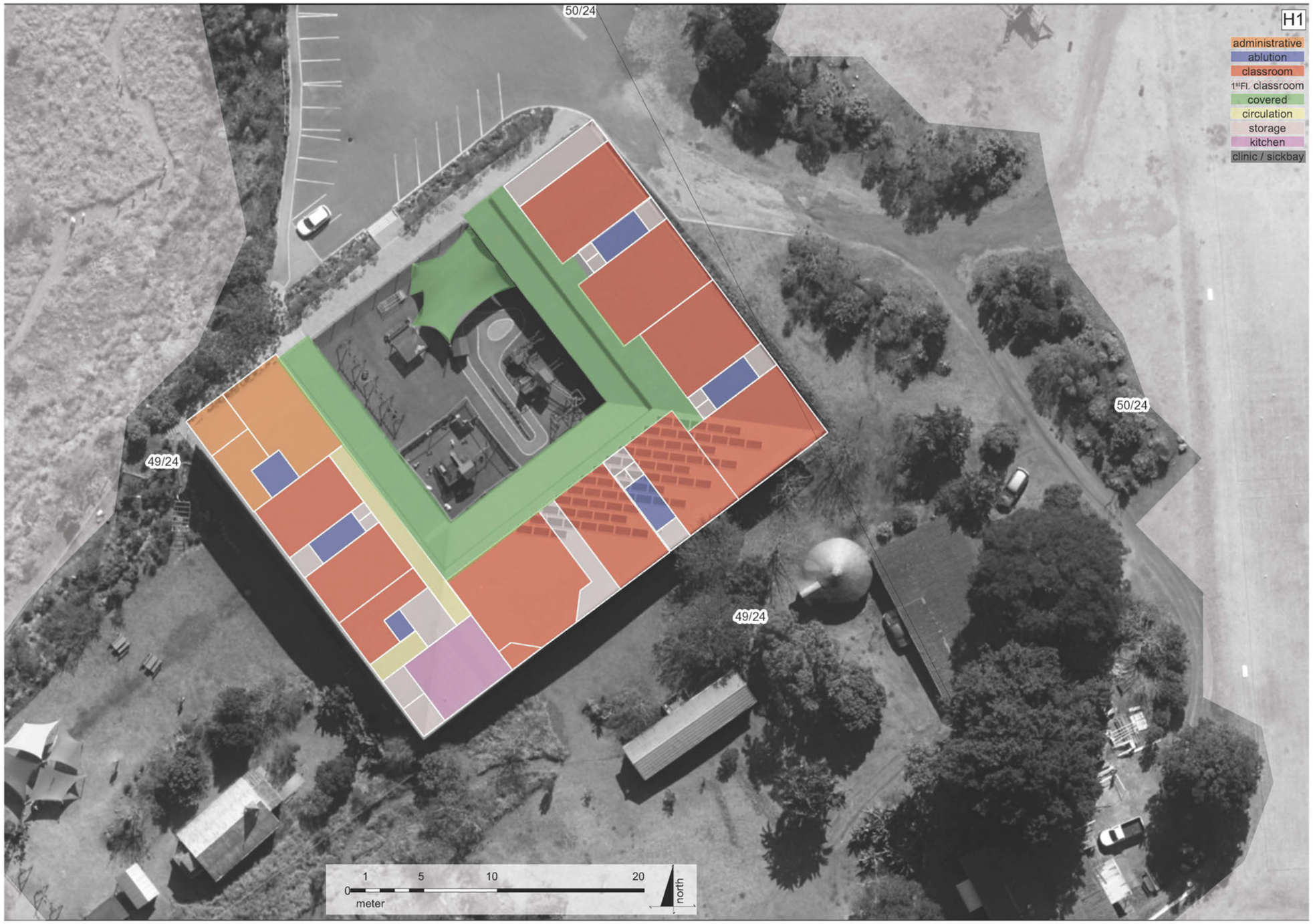

Figure 5-346 GIS Map of Site H1 with floor layout

Source: Adapted from eThekwini Municipality Corporate GIS Map Viewer (2020) (https://gis.durban.gov.za/cmv-cgis/viewer/?config=cgisPublicViewer)

5.3.8 Site H2

On arrival at the church campus, the only indication of the presence of an ECD centre is the signage and expansive play area. The ECD uses the Sunday school children's church classrooms and shares their accommodations with the church. The reciprocal relationship provides both the ECD and the church with well-maintained buildings and child-friendly learning environments, both inside and outside. Notably, the outdoor play area provides a range of activities and was specifically designed to promote gross motor skill development. Other features include large sand and water play areas. The classrooms vary, as some are more suitable and provide a better-quality learning environment, while others are not ideal, as they have no exterior windows. The additional spaces provided by the church facilities are a great advantage. This centre illustrates how ECD benefits from close relationships with other community-orientated facilities. Although the learning space has some shortcomings, the learning-through-play approach, the focus on the outdoors as an extension of the learning environment, and the inclusion of multi-purpose spaces illustrate that this ECD centre has the potential to provide quality early childhood development.

Principal: "*We started in about 2005. I took over the kid's nursery here at the church and we used the church buildings. And at that time, we had the very exciting addition of building this section for the kids' mums to eat. And then, one of the elders at the time, just had this thought about using it: It's a waste to leave it open every day, so let's use it. Why not use it as a preschool? And so, 2008, we set it up as a preschool*".

Table 5-8 Site H2: Summary of the Background and Context

Established	2008
No of Children	80
Age Range	0 to 5
Land Ownership	Owned by the church.
Buildings	Funded and constructed by the church. The centre occupies classrooms originally intended for Sunday school.
Context	Peri-urban/rural area that complies with the town planning scheme as a place of worship (educational) zoning.
Community	Established by former pastors in the church. The current principal has been involved in the centre since its inception.
Registration Status	Registered – no grants fee paying
NGO involvement	Not applicable.

Source: Cloete (2022)

Figure 5-357 View of the Entrance

Figure 5-368 Outdoor Play Area

Sources of Figures: Author (2020)

Figure 5-39 Context Map of Site H2
Figure Sources: Google Earth (2021) (https://earth.google.com/)

Figure 5-370 GIS Map of Site H2 with floor layout
Source: Adapted from eThekwini Municipality Corporate GIS Map Viewer (2020) (https://gis.durban.gov.za/cmv-cgis/viewer/?config=cgisPublicViewer)

5.4 CONCLUSION

The chapter set out to provide the background and context of the early childhood development centres in South Africa and positioned the collective case study to address research question 3: What is the status of the ECD transformation in post-Apartheid South Africa in the context of the local and global development goals?

The chapter further provided a brief overview of each of the research sites to enable the subsequent unpacking and addressing of research question 4: What are the range and qualities of the ECD learning environments in two diverse socio-economic communities in the Durban metropolitan area of KZN, South Africa? My narrative descriptions of each site provide an initial analysis of them and confirm the diversity in the range and quality of the ECD learning environments.

The inherent complexity of each site is described using the selected theoretical lenses supporting the detailed data analysis and presentation of the findings follow in Chapter Six.

6 CHAPTER SIX – PRESENTATION OF FINDINGS

6.1 INTRODUCTION

The empirical data collection from the eight research sites was discussed in Chapter Four. The discussion included the range of methodological approaches used to provide several data sets. The overarching approach to the analysis of the empirical data is thematic, in accordance with the qualitative research approach and the interpretive research paradigm. However, the research is rooted in environment-behaviour studies, which include a framework of established learning environment research approaches. Therefore, my application of thematic analysis is not confined to approaches that only support text-based data. Each of the data sets is presented individually, with a description of the analytical framework.

The primary research question for this study is: What is the relationship between responsive learning environments and early childhood development policy transformation in South Africa?

The following sub-questions are applied to answer the primary research question for this collective case study:

- What is the relationship between ECD transformation and responsive ECD learning environments?
- What are the range and qualities of the ECD learning environments in two diverse socio-economic communities in the Durban metropolitan area of KZN, South Africa?
- How do the selected ECD centres' occupants (children and adults) experience their learning environments?

Each of the questions guided the different forms of data collection, as was explained in Chapter Four, Section 4.4.1, and in the analysis that followed. The data is presented systematically, starting with the physical environment (discussed in Chapter Four, Section 4.4.1.1), using the architectural survey that provides a detailed understanding of what it constitutes, the conditions of the physical sites and the infrastructure, and how the centres occupy these sites. The second

section elaborates on the physical environment, providing more depth through the environmental evaluations. The study continues with the participatory forms of data (as discussed in Chapter Four, Section 4.4.1.2) that involved the learning environment observations, which together provide a comprehensive picture of the quality of the learning environments in the case study collection. The final section presents the interview data, which gives voices to the principals and teachers of the ECD centres. All the findings represented include a view of the impact of COVID-19 on the learning environments as the data collection took place in 2020. The chapter is structured to start with the architectural survey data set, which provides an understanding of the conditions of the physical environment. The second dataset presents the environmental assessment, which provides a holistic understanding of how the physical environment and behaviour are combined. This is followed by the learning environment observation, which provides a deeper understanding of how the environment is used. The final dataset presents the interviews that give a voice to the women associated with the research sites. The datasets and their analytical criteria are illustrated in Fig. 6-1.

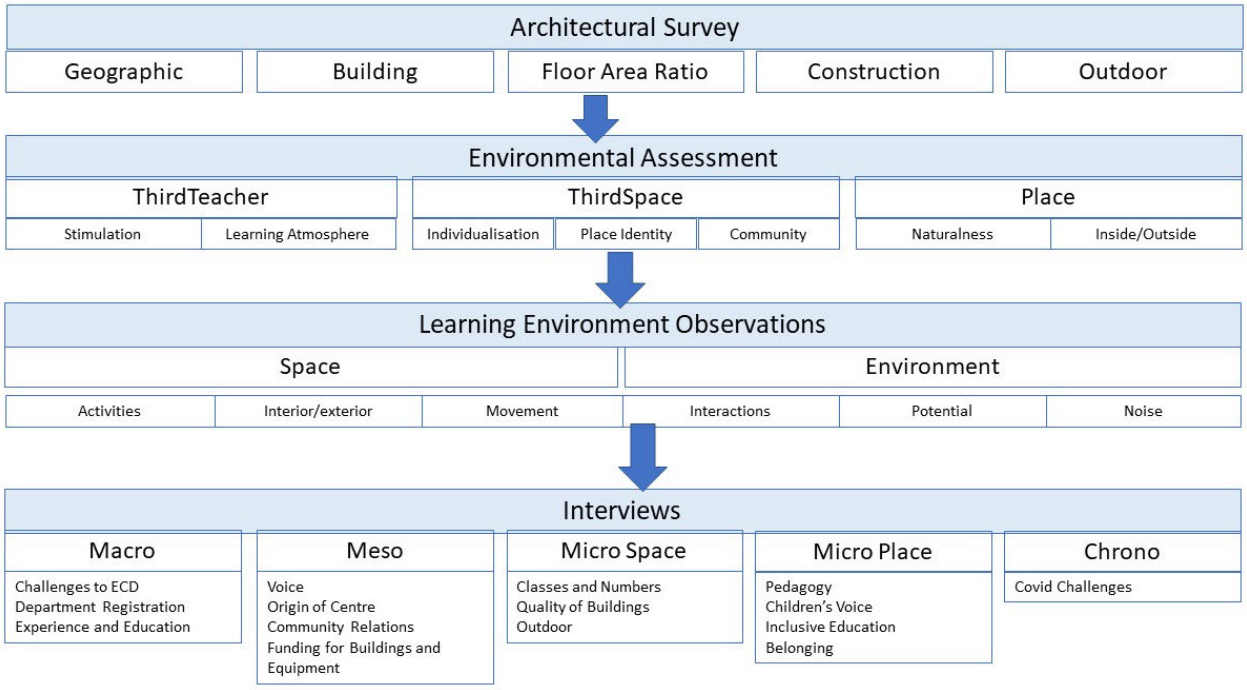

Figure 6-1 Flow of the Datasets

Source: Author (2024)

6.2 SUMMARY OF THE DATA ANALYSIS METHODS

The methods used to collect data at the eight research sites followed the research design described in Chapter Four and included an architectural survey, an environmental assessment, learning environment observations, and interviews with the principals and teachers. These data collection methods are summarised in Table 6.1. As indicated, the data collection was consistent across the sites, except in terms of the interviews, where some of the participants were not available or preferred not to participate. There were 14 participants in total, of whom 6 were principals and 8 were teachers. These participants provided rich data.

Table 6-1 - Summary of data collection methods used in Collective Case Study

Method	E1	E2	E3	E4	E5	E6	H1	H2
Architectural Survey	yes	yes	yes	yes	yes	yes	yes	yes
Environmental Assessment	yes	yes	yes	yes	yes	yes	yes	yes
Learning Environment Observations	2 groups	2 groups	2 groups	3 groups	3 groups	1 group	4 groups	4 groups
Interviews – Principals	1	1	-	1	1	-	1	1
Interviews – Teachers	1	-	1	2	1	1	1	1

Source: Author (2023)

6.3 ARCHITECTURAL SURVEY

The purpose of the architectural survey was to investigate the research question:

What are the range and qualities of the ECD learning environments in two diverse socio-economic communities in the Durban metropolitan area of KZN, South Africa?

6.3.1 QUALITY EVALUATION OF THE PHYSICAL INFRASTRUCTURE

The data collected for the architectural survey conducted in August 2020 is presented in the colour-coded format provided in Table 6.2. The table combines all the research sites to provide an overview of the diversity of the types and conditions of the learning environments. As discussed in Sections 2.4.3 and 5.2, there is limited data and few research reports available that accurately capture and illustrate the diversity of the built forms and the conditions of the physical environments of the ECD centres in KZN and in South Africa as a whole. Recent studies such as the ECD census (Department of Basic Education, 2022b) and the Thrive by Five reports (Department of Basic Education, 2022a; Thrive By Five, 2022) provide much-needed data detailing the status of the ECD sector. However, the detailed analysis of individual ECD centres has not yet been captured in these large-scale surveys and research reports. The next section proceeds to address research question four: What are the range and qualities of the ECD learning environments in two diverse socio-economic communities in the Durban metropolitan area of South Africa?

I developed five categories, combining the related criteria, to process the data captured in the architectural survey. Each of these categories is a determinant that impacts the potential quality of the learning environment and relates to aspects normally considered during the architectural design process when a responsive design approach is followed. The use of a responsive design approach appears in the literature from architectural authors (Day and Midbjer, 2007; Lippman, 2010b; Matthews and Lippman, 2020). The five categories are listed below, along with their associated criteria:

- Geographic: macro context, micro context, access routes, topography, and site area.
- Building(s) – internal: Layout/spatial arrangements, number of classes (learning spaces), ablutions, and support spaces.
- Floor area ratios: Floor areas of the learning spaces, number of children, floor area per child (ratio).
- Building construction: Construction materials and methods, construction date or dates (if in phases), and condition of the buildings

- Outdoor play area: Outdoor play area size, outdoor area per child (ratio), outdoor play area range, outdoor play condition, and natural features/garden.

The data analysis further included an evaluation of the architectural survey, which considers the quality of the physical environments using a scaled rating of 'poor', 'adequate', and 'good', as described in Table 6-2. The evaluation included the consideration of each of the criteria to determine a rating for each of the five categories to provide an overarching analysis of the quality or lack of quality of the physical environments as the first layer of the multiple methodological research design.

Table 6-2 Architectural Survey Rating Scale

RATING	DESCRIPTION	COLOUR CODE
POOR	Limited evidence of a quality physical environment	
ADEQUATE	Some evidence of a quality physical environment	
GOOD	Evidence indicates a quality physical environment.	

Source: Author (2023)

The data for all the sites is provided in Table 6-4, which provides a synopsis of the data collected from the observation schedules and the photographic analysis. The evaluation as summarised in Table 6-3 indicates the range of quality levels across the eight sites, with only sites E6, H1, and H2 achieving a rating of good quality overall. Notably, these three sites were all designed to serve as learning environments, although site H2 was designed to accommodate church-related classrooms rather than function as an ECD centre. Some of the building spaces have no external openings (windows or doors), but there is a subdivision of the space. The primary difference between the intended use and the current use relates to the number of children and the time that the children spend in these spaces. When used for church purposes, the spaces are occupied for a maximum of two hours. Although site E6 is purpose-designed and recently constructed, the site's geographic conditions include poor access, and the outdoor play areas are small and include no natural areas.

The three sites, E2, E4, and E5, achieved adequate quality ratings overall; however, only site E4 achieved this rating across all five categories. Site E2 features ample space with a good spatial ratio but has poor quality in terms of the geography of the environment due to the condition and slope of the access route. The site is very steep, and the building has two main platforms. It is notable that during the fieldwork, the principal of this centre had an injured leg, which affected her mobility. She was thus not able to use the external stairs to move from the upper platform to the classrooms situated on the lower platform or use the Grade R classroom that is on the upper floor of the main building. In contrast, site E5 is situated along a tarred road, and the site is large and has a minimal slope. Access to the site and movement on the site pose no challenges. However, the layout and construction of the building pose several challenges, with the toilet facilities in a separate structure outside and the kitchen that is accessed directly from the classrooms. A major concern on the site is the construction of the building. Part of the building has been constructed using traditional building materials (wattle and adobe), while other sections have been built using more permanent construction materials. The centre was constructed over time and has recently been 'upgraded' by means of corporate intervention; however, the intervention failed to address the actual building structure and focused instead only on the finishes (carpets, ceilings, blinds, and paint).

The two sites with an overall poor rating have elements with potential. Site E1 includes a classroom block that features a large, covered veranda. The children's ablutions are connected to each of the two classrooms and are of solid construction but in need of maintenance. The major concerns with this centre are the very steep, sloping site with a minimal outdoor play area and areas where the landscaping is eroded. A timber classroom has been added, and this serves the foundation phase children. These older children all use the toilet facilities in the main building that are accessed via the ECD classrooms. The large number of children has led to a low floor-area:child ratio. Site E3 is situated on a large property with a gentle slope. The building's construction is sound, but the building, ablutions, and play equipment are all in need of repair or maintenance. The large number of children is not suitable for the space available, specifically as all the learning areas are in one large room.

The data shows that the sites located in the low socio-economic areas are of poorer quality across the categories. The geographic areas where these sites are located include land with steep slopes, which is not ideal for building conditions and impacts the access roads and pedestrian movement. The condition of the infrastructure, such as roads, sidewalks, and stormwater drainage, is of a low standard, with several areas being serviced by dirt roads (untarred roads) and no sidewalks for pedestrians. In contrast, the sites located in the high socio-economic area were found to be of good quality across almost all categories. Although the sites are located in close proximity to a low socio-economic area, the geographic conditions include less severe slopes, and the infrastructure is of a higher standard. The only site in the low socio-economic area that has good quality overall is E6, which has been provided with a new purpose-designed building with an outdoor play area. This site is still constrained by a steep, sloping site and poor infrastructure in the area.

Table 6-3 Evaluation of the Architectural Quality Across the Sites

Site	Geographic	Buildings	Floor Area Ratios	Building Construction	Outdoor Play Area	Overall Quality
E1						
E2						
E3						
E4						
E5						
E6						
H1						
H2						

Source: Author (2023)

Table 6-4 Architectural Survey Including All the Criteria for Each Research Site

	ARCHITECTURAL CRITERIA	SITE E1	SITE E2	SITE E3	SITE E4	SITE E5	SITE E6	SITE H1	SITE H2
GEOGRAPHIC	Macro context	Peri-urban township	Peri-urban township	Peri-urban township	Peri-urban township	Peri-urban township	Peri-urban township	Peri-urban edge of suburban township	Peri-urban/suburban
	Micro context	Township site with hall and house.	Township site, converted house and hall.	Township site - central to transport.	Township site adjacent to owner's home	Township site near schools, large site with veg. garden	Township site - house and church building - small	Edge of suburban township - school and NGO campus	Suburban - church campus with support buildings
	Access routes	Tar road with short dirt road on site.	Dirt road - poor condition	Dirt road through taxi rank/wash	Tar road - steep hill	Tar road - adequate access	Dirt road - poor condition	Tar road - access control to school campus	Tar road - access control to church campus
	Topography	Steep site	Steep site	Gentle slope	Medium slope	Gentle slope - large	Gentle slope with steep bank on the side	Gentle slope	Gentle slope - large campus
	Site area	Small	Large	Large	Adequate size	Large	Small	Large campus	Large campus
BUILDING(S) - INTERNAL	Layout / spatial arrangement	1 - Linear block with large veranda	1 - Part converted house - some individual rooms	Rectangular hall divided by low walls.	1 - Open plan hall - square learning space subdivided by low partitions.	Linear layout - separate classes	U-shaped with protective courtyard	U-shaped with protective courtyard	Linear classes along internal corridor
		2 - Timber hut	2 - Converted attic as classroom. Separate access stairwell.		2. Separate prefabricated room				
		3 - Kitchen in container	3 - Large rectangular hall divided by low-level screen		3 - Separate small timber hut				
	Number of classes (learning spaces)	4	5	3	4	3	3	8	7
	Support spaces	Small office. Kitchen in container	Kitchen and sleeping area	Office and storeroom	Office and kitchen	Office and clinic space. Kitchen not suitable.	Office and kitchen	Reception, foyer, office, kitchen, dining hall, baby sleeping room, chapel/hall.	Office, multi-purpose space, fantasy hut, church hall, activity room, staff resource room.
	Ablutions	Children - 4. Not adequate for number and age ranges.	Children, 6. Adult size	Children - 4	Children - 3	Children - 4	Children - 4	Children - 2 toilets for every 2 classes	Children - 3 toilets shared by all age groups.
		Adult - 1 separate.	Adult - use children's	Adult - 1 in same space as children	Adult - 1	Adult - 1 in same space.	Adult - 1 in same space	Adult toilets - 2 + disabled facility	Adults - 1
		Access through classroom	Access to upper-level class problematic.	Access off baby area	Access from hut not ideal	Separate building - access poor	Access good	Access good for children	Access along corridor close to younger groups.
		Condition adequate	Condition poor. Some out of order.	Condition poor	Condition poor. One out of order	Condition poor.	Condition good	Condition good	Condition good. Additional

									ablutions in church section.
FLOOR AREA RATIOS	Floor areas of learning spaces	2-3 group 15,5m²	0-1 group 21m²	0-2 group 13,5m²	0-5 combined area 90m²	0-2 group 30m²	0-2 group 22,5m²	0-2 group 56m² (x2)	0-1 group 34m²
		4-5 group 29,5m²	1-2 group 25m²	3-4 group 13,5m²		3-4 group 36m²	2/3-4 group 45m²	2-3 group 72m² (x2	1-2 group 28m²
		5-6 group 29,5m²	2-3 group 76 m²	4-5 group 34m²		4-5 group 36m²	3/4-5 group 45m²	3-4 group 98m²	2-3 group 32m²
			4-5 group 74m²		5-6 group 15m²			3-4 groups 90m²	3-4 group 26m² (x2)
			5-6 group 32 m²					4-5 group 92m² (x2)	4-5 group 36m² (x2)
	Number of children	65 max.	120 max.	52 max.	56 max.	70 max.	52 max.	150 currently	116 max.
	Floor area per child (ratio)	1,14m² per child	4,38 m² per child	1,17m² per child	1,89m² per child	1,46m² per child	2,16m² per child	4,19m² per child	1,88m² per child
BUIDING CONSTRUCTION	Construction materials and methods	Basic masonry with sheet roof. Steel framed windows. Timber class not insulated.	Basic masonry with sheet roof. House has tiled roof. Steel framed windows.	Basic masonry with sheet roof. Steel framed windows.	Basic masonry with sheet roof. Exposed trusses good. Steel framed windows. Timber classroom not insulated.	Basic masonry with sheet roof. Areas with traditional mud walls. Suspended ceilings added. Steel framed windows.	Converted shipping container with timber roof structure and sheeting. Aluminium window/door frames.	Quality - masonry with sheet roofing. Aluminium window/door frames	Quality - masonry with sheet roofing. Timber windows.
	Construction date or dates (if in phases)	2011	1990	2010	1998, 2020	1992, 2007, 2011, 2018	2018	2015	1998
	Condition of buildings	Maintenance required	Maintenance required	Maintenance required	Good condition	Maintenance required	Good condition	Good condition	Good condition
OUTDOOR PLAY	Outdoor play area size	Small due to slope	Adequate	Good size	Adequate	Good size	Very small	Good size	Good size
	Outdoor area per child (ratio)	Very small	Adequate	Good size	Adequate	Good size	Very small	Good size	Good size
	Outdoor play area range	Limited	Adequate	Limited	Adequate	Adequate	Adequate	Very good	Very good
	Outdoor play area condition	In need of repair	Adequate	In need of repair	Adequate	In need of repair	Good condition	Good condition	Good condition
	Natural features/garden	Limited - some garden and trees	Strong presence of nature	Good range of plants and trees	Some plants - minimal trees	Large trees and plants. Some areas unkept.	Limited - artificial grass and potted plants.	Courtyard - artificial grass. Additional play area very good trees and plants.	Good range of plants and trees.

Source: Author (2022)

6.4 ENVIRONMENTAL ASSESSMENT

The environmental assessment followed a combination of two qualitative learning space/environment evaluation methods: clever classrooms (Barrett *et al.*, 2015) and responsive learning environments (Lippman, 2010b), as discussed in Chapter Four. The purpose of the environmental assessment was primarily to explore the range and qualities of the ECD learning environments in the collection of case study sites.

The evaluation model developed for this study combined the principles of stimulation, individualisation and naturalness with learning atmosphere, place identity, inside/outside flow, and community within the conceptual framework illustrated in Fig. 6-1. This conceptual framework was applied to establish the evaluation model for the ECD learning environments, as detailed in Table 6-5, that combines the theoretical lenses of phenomenology, ecological systems, and spatial justice.

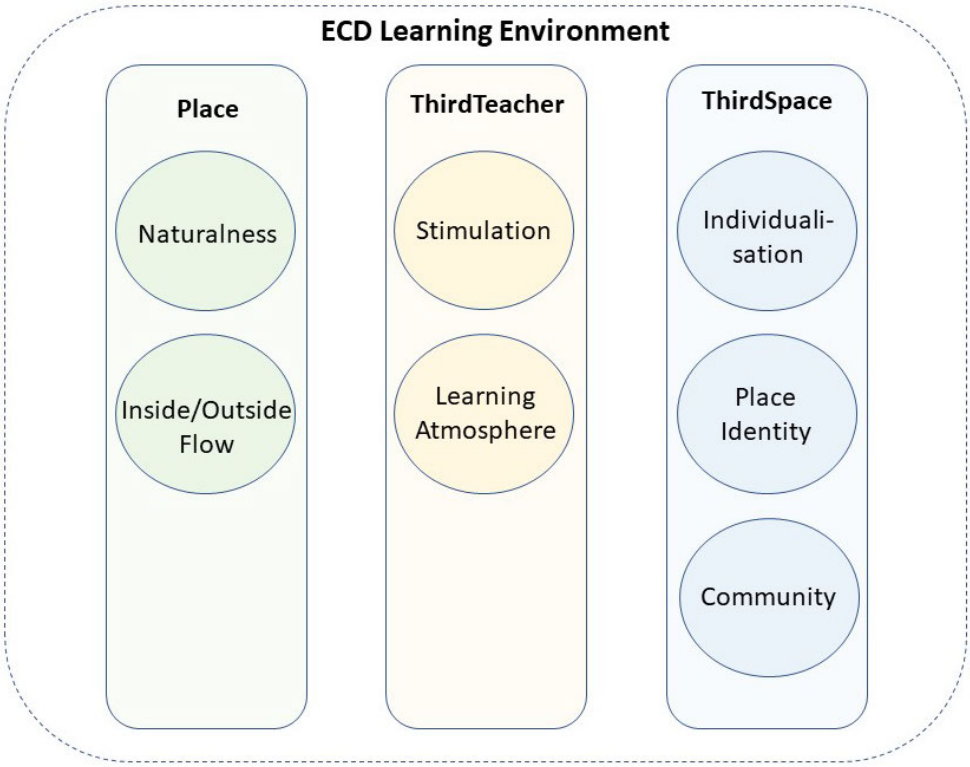

Figure 6-2 ECD Environmental Assessment Model

Source: Author (2024)

Inherent in the approach is the notion of the environment as holistic, combining the physical space with the tangible and intangible dimensions of a multi-sensory experience and the pedagogy and human dimension of social interactions.

Table 6-5 ECD Learning Environment Evaluation Model

Methodology	Criteria	Indicators	Extract from Field Notes	Patterns (Concept)
Clever Classrooms approach (Barret *et al*. 2015)	Naturalness	Light Temperature Acoustics Links to Nature Air Quality	Light - Daylight is rather low as windows are small compared to the floor area. On cloudy days electric lighting is needed (site E3).	Pattern 1 – place
	Stimulation – appropriate level of complexity (clutter and colour)	Colours Balance open/private Clutter Outdoor play Nature	Colours - Internal rooms plain (bland), forming background for wall display. Flooring includes playful patterns. Exterior includes colour and wall art (site E6).	Pattern 2 – third teacher
	Individualisation – ownership, flexibility, and navigation	Space density Scale Personalisation Flexibility Display Navigation	Flexibility – No flexibility in rectangular classrooms due to limited size. Covered play areas provide alternative space (site E1).	Pattern 3 – third space
A responsive approach to creating learning environments (Lippman, 2010)	Learning atmosphere		Potential for exploration is evident in the outdoor areas and in the classes where displays and different materials are used to encourage learning through play (site E5).	Pattern 2 – third teacher
	Flow between inside and outside areas		Limited flow between inside and outside areas. Single doors from playrooms, with no direct relationship with the outdoor play area. Windows provides some views out, but not at a low level for children playing on the floor (site E2)	Pattern 1 - place
	Place identity		The school has a very distinct identity as a place for children. This is achieved using colour, wall art and scale. The building form maximises the very limited site area and respects the existing built form (site E6).	Pattern 3 - third space
	Connection to Community			Pattern 3 – third space

6.4.1 HOLISTIC ENVIRONMENTAL QUALITY EVALUATION

The data collection process included a walk through the ECD site with a staff member or the principal for them to explain the organisation of the learning spaces. Guided by the observation schedule, I took time to investigate the environment using the criteria for the evaluation and to write field notes. I also created an extensive photographic record of the various spaces. Each site was evaluated during the observations, and a datasheet was used to capture my impressions while on site. The initial observations were then formalised with a description of the qualities related to each evaluation criterion. The analysis followed a circular process with the review of the photographs and the reading of the datasheets with the field notes.

The qualitative analysis presents the evaluation of each site using the criteria in the ECD learning environment evaluation model (Table 6-5) and the rating scale of 'poor', 'acceptable', or 'good' detailed in Table 6-2 to provide the environmental rating for the ECD learning environments as detailed in Table 6-6. The analysis illustrates the evaluation of the indicators within each criterion to enable an overall rating of the three concepts of place, third teacher, and third space. The concepts are labelled as patterns in the model and evaluation towards the potential of developing a pattern language rooted in the seminal work of Alexander *et al.* (1977) and the more recent application by Nair and Fielding (2005), as discussed in Sections 2.3.3. and 3.2.2.

Table 6-6 ECD Learning Environments' Environmental Evaluation Rating Scale

RATING	DESCRIPTION	COLOUR CODE
POOR	Limited evidence that the criteria for a quality learning environment are being met.	
ADEQUATE	Some evidence that the criteria for a quality learning environment are being met, but some inconsistencies where some aspects are still below what is required.	
GOOD	Evidence indicates that the criteria for a quality learning environment are being met.	

Source: Author (2023)

6.4.2 PATTERN ONE - PLACE

According to the environmental assessment model (Table 6-5), the data relating to both naturalness (Barrett *et al.*, 2015) and the flow between the inside and the outside areas (Lippman, 2010b) form the criteria for evaluating the sense of place. Each site was first assessed using the indicators of light, sound, temperature, air quality, and links with nature to establish the combined rating for naturalness, as shown in Table 6-7. The flow between the inside and outside areas does not include additional indicators, thus providing a singular rating for each site, as seen in Table 6-8.

The data indicate that only site E6 achieved an overall rating of good for naturalness. This site has notably recently been purpose-designed by architects who follow passive design principles. All the other sites have aspects that impact their level of naturalness. At some sites, certain classrooms present better quality; however, the scope of the project does not include the evaluation of each class individually, meaning that the ratings represent the average for each site. The two sites that were rated as poor are E1 and E5, indicating a relationship between the architectural quality data in Section 6.3 and naturalness.

Some relationships can be established by looking at the built form and how it influences the ratings in more depth. These relationships are as follows: The indicator of poor sound was found at sites where a large hall-type space is shared by three or four groups. Sound from outside is a concern when neighbouring buildings are in close proximity to the classrooms. Poor lighting conditions relate to buildings with small windows in relation to the floor area. Similarly, the positioning, size, and ability to open windows impact the air quality – at site E5, Venetian blinds obstruct the air flow, while at site H1, the windows cannot open and only the doors are openable, negating the potential for cross-ventilation. Keeping temperatures at a comfortable level during extreme hot and cold spells is particularly problematic in most of the low socio-economic sites. As noted in the architectural analysis, most of the buildings have been constructed without including insulation or other mechanisms to ensure passive cooling. The classroom constructed from timber is particularly prone to overheating, while in contrast, site E6, which is constructed from repurposed shipping containers, performs well in terms of temperature as the construction

includes insulation and the architectural design provides an additional shading roof that provides ventilation.

Table 6-7 Rating of Naturalness for all Research Sites

SITE	**Naturalness:** Light, Sound, Temperature, Air Quality, Links to Nature	Indicator Rating	Criteria Rating
E1	**Light -** Generally rooms have a low lighting level as the windows are small.		
	Sound – Neighbours' music could be heard from outside. When occupied with children, the space becomes noisy. Sounds from the surrounding neighbourhood create background noise but it is not disruptive.		
	Temperature – Acceptable as building does not overheat and is warm in cold weather. The building provides human comfort.		
	Air Quality – Cross-ventilation in most spaces when the windows are open.		
	Links to Nature – Limited natural green vegetation. View of the valley from the play area.		
E2	**Light -** Daylight is rather poor as the windows are small compared to the floor area. On cloudy days, electric lighting need to be used.		
	Sound – Noises from outside could be heard but seemed distant. With children in the large hall, the space is noisy.		
	Temperature – Acceptable as the building does not overheat and is warm in cold weather. The building provides human comfort.		
	Air Quality – Adequate cross-ventilation in the hall space. Toilets are kept clean and there is ventilation.		
	Links to Nature - Views of nature – good views of the surrounding areas.		
E3	**Light -** Daylight is adequate on both sides of the room when it is sunny outside. On cloudy days, electric lighting need to used.		
	Sound - The learning space has mostly hard surfaces and being 1 room divided into 3 learning groups; it can get very noisy. Some sounds from pedestrians walking along the access route, but generally quiet.		
	Temperature – Acceptable as the building does not overheat and is warm in cold weather. The building provides human comfort.		
	Air Quality – The room allows for cross-ventilation while the windows are open. The centre is on an open site with surrounding landscape so it gets ample fresh air. The kitchen and ablutions are accessed from the playroom. These spaces were kept clean, but the ventilation might be too limited. The kitchen has an external door but is a small space when cooking for all the children. No separate baby changing area is provided.		
	Links to Nature -The building is set on a large site with grass and vegetation. The site provides good views and		

	these can be seen from the playroom windows. Although, for younger children, the windows are still too high.		
E4	**Light -** Very light and airy space. Large windows with low-level sills. Also, high-level windows on the south side increases the light levels.		
	Sound – Noise levels in rooms is high when all the children are in their group areas. Also, noise from the road and neighbourhood can be heard.		
	Temperature – Buildings heat up on hot days. The building does not provide human comfort.		
	Air Quality – Top-hung windows and two sets of double doors can be opened for cross- ventilation. Air quality good as ablutions in separate area with windows for ventilation.		
	Links to Nature - Views of surrounding valley and greenery. Building at higher level than garden, which limits direct contact with nature. Veggie garden can be viewed from some windows.		
	Timber classroom - Small one-room timber building.		
	Light - No electricity in the classroom, but lighting seems adequate.		
	Sound - Room is a stand-alone one in the outdoor play area. Less noise disruptions; only when younger children play on the outdoor equipment		
	Temperature – Buildings heat up on hot days. The building does not provide human comfort.		
	Air Quality - Adequately sized windows on two side of the structure. Casement windows that can be opened for cross-ventilation. Door can be opened for both light and ventilation.		
	Links to Nature - Windows have views over neighbouring vegetation.		
E5	**Light** – Natural light blocked by black Venetian blinds on the windows. Electrical lights used constantly.		
	Sound – Minimal sound from surrounding area. Internally, the rooms become somewhat noisy with children.		
	Temperature – The building overheats in warm weather. In winter the space is cold. The building does not provide human comfort.		
	Air Quality – Blinds block cross-ventilation. Baby room has an unpleasant smell due to carpets on the floor.		
	Links to Nature – Minimal as only through doors. Windows mostly covered by blinds. Outdoor area has good features.		
E6	**Light** – Good level of daylight in all spaces.		
	Sound – Sounds from surrounding neighbourhood evident. Rooms not too noisy when occupied.		
	Temperature – Spaces stay cool in warm weather and warm in cold weather. The building provides human comfort.		
	Air Quality – Good cross-ventilation in the playrooms and support rooms. Toilets clean with no smell.		
	Links to Nature – Rooms have large, glazed doors with views of the play area – but not of nature. Good view of the valley from the play area. Vegetable garden below.		
H1	**Light -** Adequate daylight in all spaces with large, glazed		

	windows.		
	Sound – Some spaces had too much noise from the children. Acoustic panels had to be installed.		
	Temperature – Good level of temperature control. Spaces that overheat have air conditioning. The building provides human comfort.		
	Air Quality – Cross-ventilation of the playrooms by opening the doors. No openable windows.		
	Links to Nature – Rooms all have a glass door at the back of the room, with some views of the natural areas. It is minimal compared to the size of the rooms. Natural play area provides very strong connection to nature.		
H2	**Light -** Adequate daylight in spaces as ample glazed windows. .		
	Sound – Some spaces have too much noise from children. Noise from the circulation spaces is distracting in the classrooms.		
	Temperature – Reasonably good level of temperature control. Spaces that overheat have air conditioning. The building provides human comfort.		
	Air Quality – Rooms with external doors ventilate well. No cross-ventilation of internalised playrooms and support rooms.		
	Links to Nature – Classrooms with external doors look out onto the play area. Connection to nature not evident when inside, but very good in the outdoor play area.		

Source: Author (2023)

Furthering the evaluation to consider the flow between the inside and outside spaces, the criteria have a different focus than the indicators for the links to nature. Some sites have a good natural play area (H2) or have views of the outside areas and natural features in the play areas (E2), but there is no tangible connection between the inside and the outside spaces due to the buildings' layouts and access. Sites like E6, with a covered play area and large door openings (sliding doors), provide a better relationship between the inside and outside spaces and have the potential for a natural flow.

Table 6-8 Rating of the Inside/Outside Flow of all the Research Sites

SITE	**Inside/Outside Flow**	Rating
E1	Playrooms have good relationship with the covered play area, but outdoor play is limited.	
E2	Limited flow between inside and outside spaces. Single doors from playrooms, with no direct relationship with the outdoor play area. Windows provides some views out, but not at a low-level for children playing on the floor.	
E3	The playroom has only one external door. This limits the flow between the inside and outside spaces. The windows do provide	

	visual flow. The small patio provides a transition space between the inside and outside spaces, but the roof does not provide good cover and is at a high level.	
E4	Covered area creates the potential for an indoor / outdoor connection.	
E5	Limited connection, with blinds mostly closed and only a single door out. Baby room has no external door.	
E6	Design allows for good flow between inside and outside spaces. It reads as one space with some enclosure. Playrooms have large, glazed sliding doors that enable flow from the inside to the outside.	
H1	Design allows for good flow between inside and outside spaces. Playrooms have large, glazed sliding doors and a glazed door on the opposite side of the room.	
H2	Majority of playrooms have external doors that are kept open. Only two spaces do not have a connection.	

Source: Author (2023)

6.4.3 PATTERN TWO – THIRD TEACHER

Continuing the process from 6.4.2, the criteria of stimulation (Barrett *et al.*, 2015) and a learning atmosphere (Lippman, 2010b) were applied towards evaluating the presence of the third teacher. The sites were evaluated using the indicators of colour, balance between open (shared) and private spaces, clutter, outdoor space, and texture as presented in Table 6-9. The criteria of a learning atmosphere provided a more comprehensive view of the quality of the learning space as it provided stimulation and child-centredness, as presented in Table 6-10.

The evaluation revealed that one (E1) of the sites provided poor stimulation, and only the two high socio-economic sites provided good, stimulating environments. The evidence indicated that all sites made attempts to include colour in their environments as a child-friendly mechanism. It was noticeable that the restrictions posed by COVID-19 impacted the balance between the open and private spaces as the smaller, quiet play areas were removed. The data shows that the sites with smaller spaces and limited storage areas had more clutter, which impacted negatively on the potential for stimulation. Similarly, the indicators of outdoor space and texture were lower at the sites with the small outdoor play areas that have barely any natural features. The potential for different textures was also affected by the COVID-19 restrictions at all the research sites, as soft furniture, soft toys, sand and water trays, and all fabric toys had to be removed to ease sanitation processes. The only sites where some of these textures were still included were H1 and

H2, as they provided smaller trays that each child engaged with individually. The cost implications of sanitation negated this option at the low socio-economic sites.

Table 6-9 Rating of Stimulation for all Research Sites

SITE	**Stimulation:** Complexity, Colour	Indicator Rating	Criteria Rating
E1	**Colours** - Internal rooms are plain (bland). Curtains and floor add some colour. Exterior includes wall art, but it is starting to wash away. Plastic tables and chairs are bright primary colours.		
	Balance: open/private – Each class feels separate. Although there is glazing between 2 rooms, it is blocked with curtains. Limited private/secluded play spaces.		
	Clutter –Very limited storage space. Unused items stacked up. Classes generally bare, as toys mostly packed away due to COVID-19.		
	Outdoor space – Limited range of play facilities. Site is sloping, with erosion. Lower part of site occupied by two timber classrooms, used for primary school. Play equipment in need of repair. No equipment specifically for younger children.		
	Texture - Very little natural garden area to play and explore in.		
E2	**Colours** – Building on the top level is painted different colours that add to the character of the space, while the building on the lower level has limited colour. Plastic tables and chairs are bright primary colours.		
	Balance: open/private – Building A provides the potential for more private spaces. Building B has only public and no private spaces.		
	Clutter – Due to COVID-19, much of the play equipment was stored away, leaving the spaces somewhat bare. The rooms have limited storage spaces, with 2 steel cabinets in the 1st floor class and open shelving in Building B.		
	Outdoor space – The outdoor play areas are a good size, with both buildings having their own play area. The natural setting adds to a strong presence of nature, with lots of vegetation, trees, and a wide range of natural textures. The steep stairs may be difficult for younger children or older care givers to negotiate.		
	Texture – A good range of texture is presented throughout. Variety of play facilities (equipment). A good range of outdoor equipment is provided, both for younger and older children.		
E3	**Colours** – The primary form of stimulation is colour and display, as well as loose furniture and play equipment. The pictures painted on the external walls create a child-friendly atmosphere. Plastic tables and chairs are bright primary colours.		

	Balance: open/private – The building has limited private space, as only the principal's office provides a separate room.		
	Clutter – The building includes a separate storeroom. This was very full due to the need to pack equipment away in compliance with COVID-19 regulations. The playroom has limited storage units, causing some clutter. At the time of the data collection, the baby area was used to store equipment and provided a baby changing space. (Only 1 baby was enrolled, who was accommodated with the toddler group).		
	Outdoor space – The outdoor play area includes vegetation and good views of the surrounding areas. Outdoor equipment needs upgrading. The vegetable garden needs to be replanted. The play area is large and shows potential for further development.		
	Texture – The garden provides a range of textures. The condition of the building is poor, with several areas that could be seen to be unsafe.		
E4	**Colours** - The shared classroom is painted in monotone green colours and forms a background. Similarly, the screens are a plain colour. The grey and beige checkerboard floor adds colour and playfulness to the space. The exposed timber trusses add warmth, texture, and complexity to the space. The trusses are at a high level, which removes them from become distracting. The timber classroom has a warm feeling as the natural timber is exposed. Flooring and ceiling are both neutral colours. A display adds complexity and stimulation, but as the room is small, it can become distracting.		
	Balance: open/private – Minimal private space in a shared room. Office and kitchen are separate. Timber classroom provides no private space.		
	Clutter – The main building does not include a storeroom. Unused items are stored in a container classroom. Before COVID-19 this was used as a class. Storage cupboards are located in two of the group areas.		
	Outdoor space – Outdoor play includes grass and areas of open soil (mud). A timber climbing frame provides a range of play activities. There is smaller outdoor play equipment in a different area. The vegetable garden is located in a separate area, in a shaded enclosure. Loose outdoor play equipment is used to add variety to the play.		
	Texture - The play area has no shrubs, bushes, or trees for shading. No sand and water play due to COVID-19 restrictions.		
E5	**Colours** – External walls are painted dark green. Internal walls are light green and blue, with dark green to add height. Carpet dark is blue, ceiling is white. Blinds are black. The combinations of colours are not ideal as the space comes across as busy.		
	Balance: open/private – Rack for hanging school bags for each child. No other individualised areas and no quiet play area.		
	Clutter – Rooms do include some storage cupboards, and there is a storeroom. The size of the rooms make it look less cluttered.		

	Outdoor space – Large areas of outdoor space providing for different types of activities. Range of age-appropriate play equipment. Sandpit needs repair. Grass under the climbing frames is trampled.		
	Texture – The outdoor areas provide a range of textures.		
E6	**Colours** - Internal rooms are plain and monotone, forming a background for wall displays. Flooring includes playful patterns. Exterior includes colour and wall art.		
	Balance: open/private – Each child has a wall hook to hang their bag. The playrooms provide no space for quiet play.		
	Clutter – No clutter as toys mostly packed away. Small storeroom and storage shelves in each classroom.		
	Outdoor space – Artificial grass and covered play area that has some range of equipment. Steps and colour add to the quality. No natural garden in the play area. Very small space.		
	Texture - Some texture variety with potted plants. Rooms seem artificial. Lack of natural materials. Timber trusses provide balance.		
H1	**Colours** – Background colour is light grey, with primary colours used as accents to identify class groups.		
	Balance: open/private – Classrooms are private rooms and each child has a place to store their school bag in the class. The play areas are shared, with limited opportunity for quiet play.		
	Clutter – Limited, as rooms have separate storerooms.		
	Outdoor space – Courtyard play area has a good range of equipment, all on artificial grass. Additional natural play area is large, with some equipment and a sensory garden.		
	Texture – With the natural garden there is a good range of textures. Building is mostly hard surfaces.		
H2	**Colours** – Background colours are neutral, with colourful artwork on one wall in each room.		
	Balance: open/private – Classrooms are private rooms, and each child has a place to store their school bag in the class. The play areas are shared, with limited opportunity for quiet play.		
	Clutter – Limited, as rooms have cupboards for storage.		
	Outdoor space – Good-sized space and a variety of outdoor equipment. Large trees and vegetation add to exploration.		
	Texture – Natural materials in the building add to texture, as well as natural elements in the outdoor play area.		

Source: Author (2023)

At all the sites, it was evident that the staff made an effort to provide a stimulating learning atmosphere. The evidence presented in Table 6-10 indicates that none of the sites were rated as poor, and those at an adequate level were either affected by the physical site constraints or the impact of COVID-19.

Table 6-10 Rating of the Learning Atmosphere for All Research Sites

SITE	**Learning Atmosphere**	Rating
E1	The atmosphere is playful and child-friendly. The outdoor area is not ideal and poses some safety concerns that hamper the potential of the site.	
E2	An overall child-friendly atmosphere, with potential for learning and play.	
E3	Some evidence of a child-friendly space in the garden and colour. The layout deters from the potential.... It feels empty due to COVID-19.	
E4	Some evidence of creating a learning atmosphere, specifically in the timber classroom.	
E5	Potential for exploration is evident in the outdoor areas and in the classes where displays and different materials are used to encourage learning through play.	
E6	The building design and art features create the potential for learning.	
H1	Elements of a learning atmosphere are evident in the Lego features and art display. Classrooms and outdoor area provides exploration space.	
H2	Potential for learning is evident in the display and the wall art. The outdoor play area is evidently an exploration place	

Source: Author (2023)

6.4.4 PATTERN THREE: THIRD SPACE

The study considered the potential for a third space by examining the criteria of individualisation (Barrett *et al.*, 2015), place identity, and a sense of community connectedness (Lippman, 2010b). The evaluation found some differences in the ratings of the three criteria, as each considered a different aspect of the theme.

In terms of individualisation, the two high socio-economic sites (H1 and H2) performed well, with only the indicator of scale deemed in-adequate. Notably, the scales of the low socio-economic sites that tend to have a domestic nature seem more appropriate for young children. Site H1 includes classrooms that are over-scaled, in terms of the floor area and floor-to-ceiling height, and site H2 similarly includes high ceiling heights. Site H2 performed better with a good rating across four of the five indicators, showing the value of an architecturally designed ECD learning environment. Similarly, site E6, which is also architecturally designed, presented the best rating among the low socio-economic sites.

The limitations to flexibility relate to the spatial configuration and floor areas. Site E3 has one large space for three age groups, that is permanent, while in contrast, sites E4 and E2 that have

similar large, shared spaces include movable partitions that provide opportunities for changes to the layout. Site E1 offers limited flexibility due to the floor area available and site constraints (as noted in 6.3.1). Most of the centres included displays of children's artwork and other learning materials, but the wall area available at sites E1 and E3 was a constraint. The personalisation of the space was generally limited due to the COVID-19 restrictions, but it seemed that each site dealt with the issue differently; some teachers continued to display the art while others removed almost everything, as was found at site E4 in the main learning space. The findings indicate that the lowest rating for navigation relates to site E5, and that is the result of phased construction with no architectural design process. The building has several challenges: the space allocated to the 0–2-year age group is only accessible through another classroom or the administrators office; the ablutions are in an external structure; and the kitchen is positioned between two classrooms. The sites that include additions of timber classrooms (sites E1 and E4) have similar issues where the ablutions are only situated in the main building.

Table 6-11 Rating of Individualisation for all Research Sites

SITE	**Individualisation:** Ownership, Flexibility, and Connection	Rating	Overall Rating
E1	**Space density** - Seemed low for the number of children per room. This was due to COVID-19. The outdoor play area is very small, and the inclusion of primary school classes on the property is problematic.		
	Scale - School has a domestic scale.		
	Personalisation – Spaces are personalised with displays and children's art. Each child has a hook on which to hang their school bag.		
	Flexibility – No flexibility in the rectangular classrooms due to limited size. Covered play areas provide alternative spaces.		
	Display – Limited display space on walls.		
	Navigation – Main building designed as two classrooms, each with toilets. Other classes have to move through these rooms to access the toilets.		
E2	**Space density** – Less children than before COVID-19. The school has several different classrooms. Only one building was occupied at the time. The density on the day was low. If fully occupied, the density will be too high.		
	Scale – Overall a child-friendly atmosphere with a domestic scale on the upper platform. The building on the lower platform is a converted hall which presents a large open space that could seem overwhelming to young children. The spaces are usually used for older groups, but all the children were in this space due to COVID-		

	19. The main building has a more appropriate scale.		
	Personalisation – Display of children's art is used to create a sense of ownership, but there are limited individual spaces.		
	Flexibility – Building A has designated spaces that allow for minimal flexibility. Building B is a large hall space separated by a timber screen to create two learning areas. This space is flexible. Institutional feel: Building A has a child-friendly appearance and no institutional language. Building B tends towards an institutional feel.		
	Display – Children's art is displayed on the walls throughout the various classrooms. The areas for younger children are decorated in a playful manner. The exterior of Building A has child-friendly artwork painted on the walls.		
	Navigation – In building A, the routes are confusing. Children using the classroom on the 1st floor have to walk outside and through other learning spaces to access the toilets. Building B is fairly simple to navigate, although the entrance to the school is on the side wall and not evident on arrival. The access route to Building B is via a steep stairway.		
E3	**Space density** – All the children are accommodated in one playroom. The space is divided with low-level brick walls to create three spaces. A larger space is for the older children, and the two smaller spaces are for toddlers and babies. This arrangement limits the potential for individualisation and providing quiet spaces. There is a porch along the side of the building with a roof cover, and this does provide an alternative area to the inside.		
	Scale - The building form reads as a hall. The building scale is appropriate for young children.		
	Personalisation – Child-friendly images are painted outside to give some identity. The use of wall colour and displays inside the playroom lend a sense of ownership.		
	Flexibility – The layout does not provide for flexibility, as the dividing walls are permanent.		
	Display – All art is displayed on the wall using Prestik, as the space has no pinboards. The wall area is limited, and the intense wall colour detracts from the displays.		
	Navigation - All the spaces are connected internally. The route to the ablutions passes through the group area for the babies and toddlers.		
E4	**Space density -** The space was ample for the number of children at the time, but if full occupation is reached the density will be high.		
	Scale - The scale of the building relates to the surrounding area, but it is identifiable as a community building / school. The timber classroom is at a good scale for small children.		
	Personalisation - Ownership seems limited in the main building. No art display is evident. The large room is subdivided by moveable partitions that could be used as display space. No colour is used to define the various group areas. The character of the school is not institutional; however, due to COVID-19, the spaces seem unoccupied. Only the play equipment and minimal display suggest that it is a space for children. The timber classroom shows some ownership.		
	Flexibility - The main building can be reorganised with moveable partitions. The timber classroom is small and does not allow for flexibility.		
	Display – Walls and partitions allow for displays. The display in the timber room adds to the character.		

	Navigation - The school is on a small site, with most of the learning space in the main building keeping everything connected. There is limited direct connection to the outdoor play area. Windows do provide views. The route to the ablutions between the partition screens is relatively clear. Children are, however, at a low height, so they may find it somewhat confusing as all the screens are the same colour, so no wayfinding is evident. The new timber classroom is a bit removed. The children from that class still use the ablutions in the main building.		
E5	**Space density** – Rooms are a good size but density depends on the number of children. Large outdoor area provides additional space.		
	Scale – Suitable for children, with two-tone walls breaking the height of the walls. No low-level windows.		
	Personalisation - One classroom has an L-shaped layout, providing the potential for quiet areas. Overall, a display is used to create a child-friendly space.		
	Flexibility – Room sizes allow for some flexibility.		
	Display – Walls and pinboards used for displays seem adequate.		
	Navigation – Route to the baby room is through the office or another classroom, thus not ideal. Toilets are located outside, away from the classrooms.		
E6	**Space density** – Space density is dependent on the number of children. The classes are generally small, and the outdoor area is small.		
	Scale – School has a domestic scale and is appropriate for children. Windows not at child height, but glazed doors give views out. The courtyard layout provides intimate space.		
	Personalisation - Spaces personalised with displays and art.		
	Flexibility – Limited flexibility of the spaces. The covered play area provides some opportunity for an alternative to the classrooms.		
	Display – The character is playful and child-friendly, not institutional.		
	Navigation – The courtyard building is easy to navigate.		
H1	**Space density** – The space density is low in most rooms as the rooms are large.		
	Scale – The external scale is more suitable for children, with the veranda at a lower level. Inside rooms are large rooms and the high ceiling is not at child-scale.		
	Personalisation - Each child has a dedicated pigeonhole for their bag and shoes. A display and children's art add to the child-friendly character.		
	Flexibility – Size of the rooms allows for flexibility in the layouts and additional use of the hall and chapel provides flexibility.		
	Display – Children's art display is evident throughout.		
	Navigation – Courtyard layout allows for easy navigation. The corridor is wide.		
H2	**Space density** – The number of children is suitable for the spaces. Larger rooms with doors connected to the outdoors work better.		

	Scale – The building designed as a church, with high ceilings, is not suitable for children. The scale of the outdoor play façade is better.		
	Personalisation - Each child has a dedicated pigeonhole for their bag and shoes. Larger playrooms allow more personalisation than smaller rooms. The artwork in each room gives them a distinct character.		
	Flexibility – Flexibility is provided with the use of a multipurpose room and additional spaces in the church.		
	Display – Walls are used to display art and learning materials. There are also strings with artwork pegged on them. Some rooms have limited wall space for displays.		
	Navigation – This is fairly simple along a corridor. The corridor is too narrow for the number of children, as all have to use the route to get to the toilets.		

Source: Author (2023)

The criterion of place identity is based on my experience and combines how a building's site, arrival area, and learning areas communicate. The evaluation shows a contrast, where site E1, which generally had lower ratings for the other criteria, has a rating of good for place identity. The other two sites, E6 and H2, are consistent in their quality level being higher than those of the other sites. The only site with a poor rating for place identity, site E4, is similarly also in contrast to most of its quality ratings, which are at an adequate level. One of the critical aspects included in this evaluation was to consider the institutional character as negative, as this would work against a child-centred approach. The poor rating for site E4 is related to a combination of constraints that could be ascribed to the site's topography, the positioning of the buildings, and the arrival or reception area. The site is also supported by an NGO, which creates uniformity in terms of the colour scheme used at most sites; however, this being grey tends to limit a more child-centred character.

Table 6-12 Rating of Place Identity for all Research Sites

SITE	**Place Identity**	Rating
E1	The little school has a unique character and sense of place. The approach leads around the building, with wall art on the side to indicate it as a place for children. The veranda provides a good transition space before entering the classes. The atmosphere is relaxed. When the older primary children join, the space becomes too busy.	
E2	The overall sense of place is evident in the main building as the entrance is somewhat obscured. The hall does not have such a positive sense of place. The natural setting adds to the overall sense of place.	
E3	The site's setting with trees along the side, along with the use of colour and the mural, provides a sense of place. The building reads as neglected due to the lack of maintenance. Some character is created	

	internally with colour and displays.	
E4	The site has more of an institutional character. The connection between the main building and the outdoor area is limited by the slope and the close proximity to the road.	
E5	The site is provided with an identity by the large tree at the entrance and the rich colour of the building. The building form and layout do not offer a sense of place.	
E6	The school has a very distinct identity as a place for children. This is achieved using colour, wall art, and scale. The building form maximises the very limited site area and respects the existing built form.	
H1	The building design and materials fit the overall campus character. The U-shaped layout does provide a sense of place, but the large rooms do not contribute to child place. A child-friendly atmosphere is created by the finer details.	
H2	The campus features several large trees which, combined with the building's design, achieves a sense of place and a unique identity.	

Source: Author (2023)

The final criteria for the potential of the third teacher evaluates community connectedness, and my evaluation is similarly based on my experience as well as my knowledge gained from the interviews and architectural analysis. Aspects that contributed to a positive community connection rating include the positioning of the ECD centre on a site that provides other community services. These include health services (site E5), church gatherings (sites E6 and E1), and services for disabled children (site E1). The positive relationships thus include physical spaces to accommodate these functions on the same site. The low socio-economic sites that include the owner/principal living on the property also contribute towards connectedness. Site H1, which is situated on a school campus, and site H2, which is on a church campus, similarly benefit from these relationships. However, the sites that were rated as adequate seem to be contained to their immediate site rather than the surrounding community through additional services. The only site where no evidence of a community connection was found is site E3, which seems to be functioning in isolation.

Table 6-13 Rating of Community Connectedness for all Research Sites

SITE	**Community Connectedness**	Rating
E1	Centre nestled in the community, with residences and a small hall in the immediate surrounds. Connected to the street.	
E2	Centre originates from a church, providing a connectedness that is also achieved with the residences on site.	
E3	Connectedness with the community is not evident. The centre seems to be contained to the site boundary. Views out provide visual connections.	
E4	Centre forms part of a residential community and has presence on the	

	street where it is located.	
E5	Centre forms part of the community with its health facility and sharing of resources. Part of the building was constructed by the community.	
E6	Centre forms part of a church and residential community. The centre has strong visibility in the immediate surroundings.	
H1	Community connection with the rest of the school campus and the NGO on site. Views of the surrounding areas and visibility from the road provide a broader connection. An actual community seems to be contained on the campus.	
H2	Community created by a church campus that includes a café. Limited sense of connection beyond the site boundary as there is no street presence.	

Source: Author (2023)

6.4.5 SUMMARY OF THE ECD LEARNING ENVIRONMENTS' ENVIRONMENTAL QUALITY EVALUATIONS

The final process of the ECD learning environments' quality evaluations required the overlaying of all the criteria that support the sense of place, the third teacher, and the third space, as shown in Table 6-14. The combined evidence shows that the only low socio-economic site with a good-quality learning environment is site E6, while both the high socio-economic sites (H1 and H2) emerged as being of good quality. The overall quality of the low socio-economic sites was found to be adequate, and although some sites performed poorly in some of the indicators, none had an overall rating of poor.

Table 6-14 Summary of the Environmental Quality Ratings for all Research Sites

	Place		Third Teacher		Third Space			Environ-mental Quality
Site	Naturalness	Inside/ outside	Stimulation	Learning Atmosphere	Individualisation	Place Identity	Community	
E1								
E2								
E3								
E4								
E5								
E6								

H1								
H2								

Source: Author (2023)

6.5 LEARNING ENVIRONMENT OBSERVATIONS

The methodology that includes the observation of the interactions of people in spaces provides a holistic understanding of the learning environment. As discussed in Chapter Four, Section 4.4.1.2, the observations of classrooms or learning areas were conducted per age group at all the research sites. The observational datasets were reviewed carefully to identify themes and ideas to allow for organisation into categories. The analysis used the themes as a framework for coding and developing a complex picture of each learning environment. The analysis was furthered through the concepts of the third teacher and the third space to consider the potential of the physical environment to become an enabling environment for children to explore and interact towards developing a sense of belonging and meaning (place) (Lippman, 2010b). The instruments that were combined to provide the observational data include the time-based activity record, behavioural mapping, and observations of the spaces and environments. The observations were categorised as space or environment, using a set of codes that were considered according to the questions illustrated in Table 6-15.

Table 6-15 Observation Coding

Codes	Space (Third Teacher)	Environment (Third Space)
Activities	What activities can be supported in the space?	What environment is created to support the activities?
Interior/exterior relationship	How does the space support interaction between the interior and exterior?	How is the relationship enacted?
Movement	What movement is supported by the space?	What movement is enacted in the space?

Interactions child/child and child/adult	How does the space support relationships?	What relationships are observed?
Potential / Affordance	What activity does the space afford?	How is the potential enacted?
Noise	How does the space influence noise?	What noise (sound) is observed?

Source: Author (2022)

6.5.1 ENVIRONMNETAL OBSERVATIONS EVALUATION

Following the initial phase of data organisation and capture, a process of evaluation of the quality of each environment was included. The evaluation considered the degree to which the space and the environment enabled exploration, independence, and development as the dimensions of quality (Berris and Miller, 2011). The evaluation initially considered each of the data sets as an active or passive measure of exploration or engagement that was enabled (Lippman, 2010b). An additional criterion of active and controlled exploration and engagement emerged through the analysis and evaluation process of the active and passive exploration and engagement. The notion of active and controlled exploration and engagement refers to the containment of the potential for them, either through the pedagogic approach being teacher-centred or because of the impact of the COVID-19 restrictions, where children had to be contained within a defined space but were still encouraged to play freely. The evaluation criteria and rating are described in Table 6-16.

Table 6-16 LE Potential Evaluation Rating Criteria

Potential	**Description**	**Rating (colour code)**
PASSIVE	Limited exploration / engagement	
ACTIVE	Full exploration / engagement	
ACTIVE AND CONTROLLED	Exploration / engagement is contained	

Source: Author (2023)

The evidence from each site varied, depending on the age groups that were present during the data collection period, as shown in Table 6-17. Notably, some of the sites combined the children to form an older and younger group, as the attendance and enrolment were lower than prior to and after the COVID-19 pandemic lockdown. Only two centres offered Grade R that included 5–6-year-old children, namely sites E1 and E4.

Table 6-17 Identification of Age Group Observations per Research Site

	E1	E2	E3	E4	E5	E6	H1	H2
Age 0 - 2			✓		✓		✓	✓
Age 1 - 3		✓						
Age 2 - 3				✓	✓		✓	✓
Age 3 - 4	✓				✓		✓	✓
Age 3 - 5			✓			✓		
Age 4 - 5		✓		✓			✓	✓
Age 4 - 6	✓							
Age 5 - 6				✓				

Source: Author (2023)

The sections that follow provide the evaluation of the various age groups at each research site.

6.5.2 SITE E1

Age Group: 3 – 4
Observation Time: 09:26 – 09:51
6 children | 2 adults

Table 6-18 Site E1 (Age 3-4) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
09:26	Sitting in chairs – distanced and wearing masks. Teacher discusses the weather chart.	
09:27	Teacher hands out stars to all the children.	
09:28	Teacher discusses the transport theme.	
09:33	Song and dance with teacher. Walk around the room identifying colours.	
09:37	Learn about colours in their seats.	
09:38	Teacher says 'no touching' to children who are sitting +/-1m apart.	
09:41	"Head, Shoulders, Knees and Toes" singing and dancing. Marching on the spot. Listening activity.	
09:44	Door opened.	
09:45	Teacher 2 takes over the class. Teacher asks questions of each child (in English): "What is your name? What is your surname? How old are you? Where do you live?" All children answer in English.	

Figure 6-3 Site E1 (Age 4-6) Activity Map

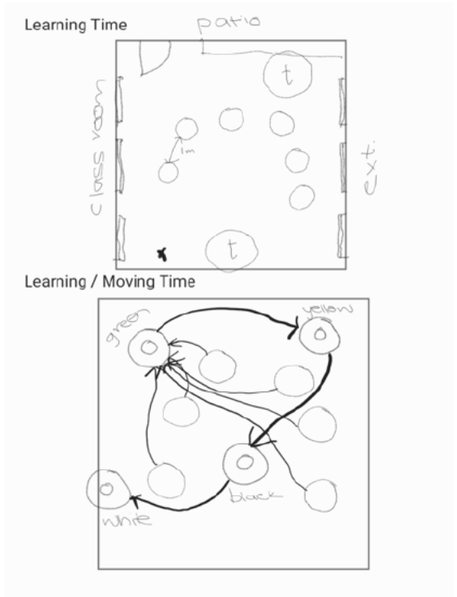

Table 6-19 Site E1 (Age 3-4) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Small room designed for a small group. All activities in one space.		Singing/dancing/learning on seats that are distanced.	
Interior/ Exterior Relationship	Small high-level windows, children may be able to see trees from the opposite end of the room. Door opens onto a covered patio. Some natural light and ventilation.		Limited connection to the outside. Children seem to want to be outside and prefer the door to be open.	
Movement	Circular movement promoted – only one point of access.		Stand up and sit down/ marching/jumping (on spot). Micro movements through learning activities i.e. colours in the room.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – high level windows are inappropriate for child views. Appropriate no. of children for the space i.e., no crowding.		Teacher very involved – talkative/engaging. Attentive/responsive to the teacher. Individual teacher/child conversations. isiZulu/English spoken.	
Potential/ Affordance	Views of garden/valley/nature not visible to children.		Children ready to run directly out onto the covered patio to play outside.	
Noise	Close door to prevent sound travel. Windows between the classrooms allow noise to travel.		Responsive/calm. Energetic when answering questions. Some noise from the adjacent classroom.	
Overall				

Source of Tables and Figure: Author (2023

Synthesis

The timed activity (Table 6-18) was found to be mostly passive, as is seen in the learning time activity map (Fig. 6-3). Some engagement is encouraged and enacted, but it is contained within the COVID-19 square. The learning time that followed indicates engagement and movement; however, the spatial qualities, configuration, and limited floor area of the room contains the children's exploration.

The overall potential of the space is passive, and the environment is active and controlled as per Table 6-19.

Age Group: 4 – 6
Observation Time (Classroom): 09:53 – 10:20 Observation Time (Outside): 10:27 – 10:41
24 children | 3 adults

Table 6-20 Site E1 (Age 4-6) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
	CLASSROOM	
09:53	Teacher discusses transport theme.	
10:01	Teachers set up tables and chairs for art time.	
10:05	Teacher hands out a pair of scissors to each child.	
10:08	Collage-making at tables.	
10:14	Child swirls a pair of scissors on the table in a hypnotic way.	
10:17	Child goes to toilet. On the way back, child finds toy and packs it away.	
	OUTSIDE	
10:27	Exercise time: five children at a time. Exercises include: ball skills and jumping on the spot.	
10:33	Wash hands outside.	
10:34	Snack time outside for older children (6-7). Next five children for exercise time.	
10:41	Next five children for exercise time.	

Figure 6- Site E1 (Age 4-6) Activity Map

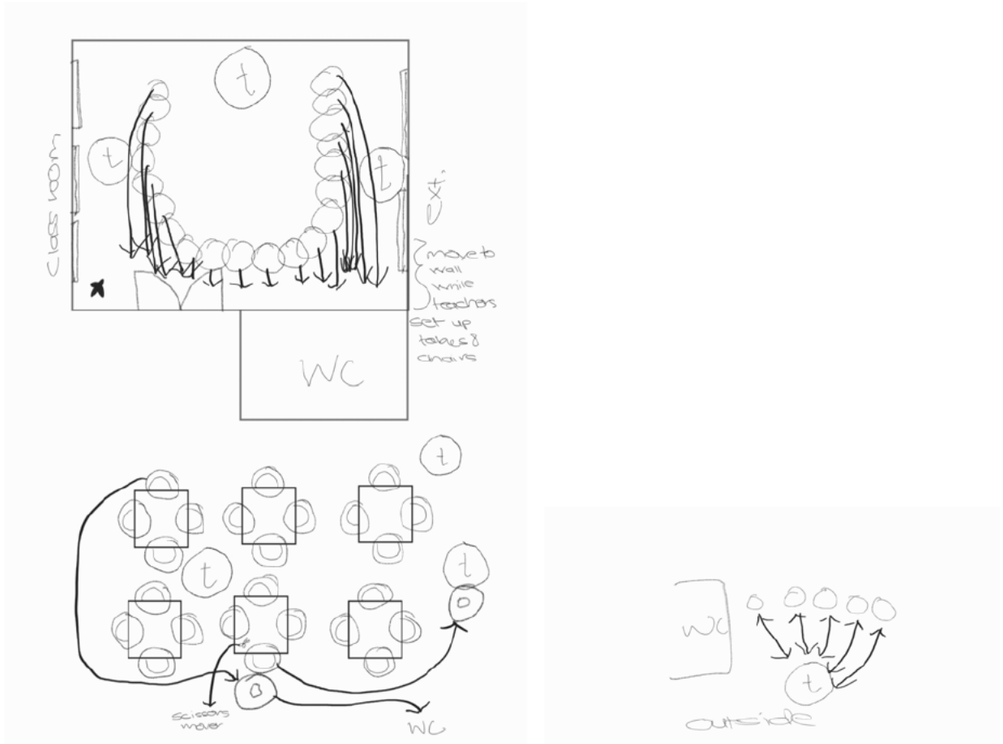

Table 6-21 Site E1 (Age 4-6) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Moveable furniture designates activity, i.e., tables and chairs. One space only.		Learning in a circle around the teacher – not distanced. Collaging at tables.	
Interior/ Exterior Relationship	Small high-level windows, so children may be able to see the earthen retaining wall from the opposite end of the room. Door opens onto covered patio. Little natural light and ventilation.		Limited connection to the outside. Limited awareness of the outside. Door usually closed, preventing connection.	
Movement	Circular movement promoted – only one point of access. More interior space to move around than in the other classroom; however, more children in the space.		Move from sitting around the teacher to sitting at the tables. Micro movements, i.e., a pair of scissors on the table. Controlled movements due to spatial and COVID-19 restrictions. Exercise movements outside on a sandy earth patch.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – high level windows are inappropriate for child views. Comfortable volume and size. Inappropriate no. of children for the space, i.e., crowded.		Observant group – Watching/ listening to the teacher. Talking to friends in small table groups. Excited to exercise outside.	
Potential/ Affordance	Large rectangular room affords interior spaces that use materials and other elements to designate activity.		Numbers of children inhibit free exploration. Covered patio outside can be used, even if it's raining.	
Noise	Windows between classrooms allow noise to travel.		Noise from the covered patio. Some noise from the adjacent classroom.	
Overall				

Source of Tables and Figure: Author (2023)

Synthesis

Timed activity indicates a more active environment, although the pedagogic approach leans more towards teacher-centredness with directed engagement. The scale and spatial qualities show potential for exploration; however, the number of children, seen in the mapping (Fig. 6-4), confirm the control seen in the activity. Due to the restricted play area, the outdoor activity also follows a controlled form rather than free play. The overall potential of the space is passive due to movement and interaction being restricted. Considering the spatial ration, teacher-centredness and COVID-19 restrictions, the environment is found to be active and controlled, as per Table 6-21.

6.5.2. SITE E2

Age Group: 1 – 3
Observation Time (Classroom): 10:13 – 10:38 Observation Time (Outside): 11:15 – 11:28
13 children | 2 adults

Table 6-22 Site E2 (Age 1-3) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
	CLASSROOM	
10:13	Babies sleeping. Others sitting – distanced.	
10:15	Teachers set up tables. Children move to tables.	
10:18	Prayer. Teacher hands out the school bags. Children remove snacks from their school bags.	
10:20	Snack time.	
10:28	Teacher feeds the babies.	
10:32	Children playing around the tables.	
10:34	Child starts crying. Baby drops juice on the mat then takes a walk around the classroom.	
10:35	Baby finds a teddy bear on the floor and hugs the teddy bear. Interacts with older children who are eating at their tables.	
10:38	Some children go to the toilet in the adjacent room	
	OUTSIDE	
11:15	Ecstatic shrieks of joy.	
11:23	Rooster calls.	
11:25	Child picks up a dandelion. Child crumples the dandelion.	
11:28	Child crawls onto rocks.	

Figure 6-4 Site E2 (age 1-3) Indoor Activity Map and Outdoor activity sketch

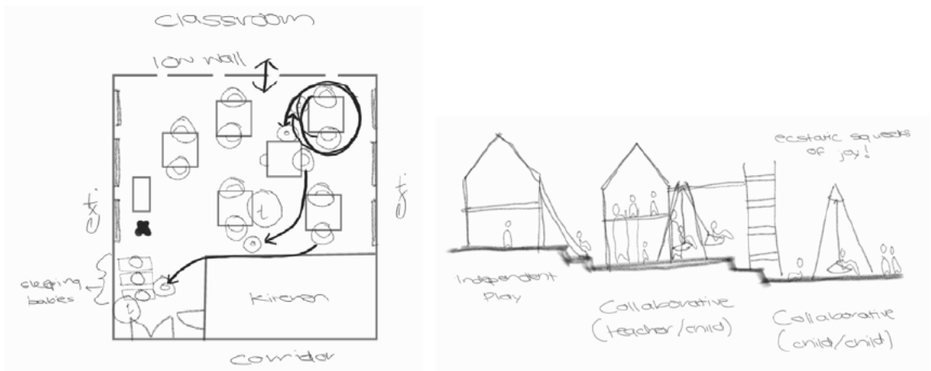

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Table 6-23 Site E2 (Age 1-3) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Two spaces within one grand room. Low partition wall divides spaces. Space for material changes.		Sitting in chairs – distanced. Eating at tables. Play around tables. Play/flower picking outside.	
Interior/ Exterior Relationship	Windows are a suitable height for children to have a view of the valley. No artificial light being used. Some natural light and ventilation.		Limited connection to the outside. Children seem oblivious to the outside. Barefoot outside – direct contact with the earth.	
Movement	No movement promoted although space exists for adequate interior movement – result of COVID-19.		Slow, controlled movements. Run to bag when called by the teacher. Swinging/sliding/climbing outside.	
Interactions – Child/ Child and Child/ Teacher	Child/space – windows are appropriate for child views. Tall volume counteracted by the roof truss. Appropriate no. of children for space i.e., no crowding.		Only two children per table. Talk to friends at table. Share food. Respond to the teacher. Teacher talks to the babies in isiZulu.	
Potential/ Affordance	Views of the valley afford learning opportunities. Tall volume and exposed truss afford hanging/ climbing elements.		View slightly obstructed by burglar guards. Children afforded play opportunities around the furniture. Imaginary/solitary/independent play afforded in the outdoor play area.	
Noise	No architectural devices to prevent sound travel.		Quiet/serene/eerie. Noise travels between the classrooms.	

Source of Tables and Figure: Author (2023

Synthesis

Reviewing the timed activity evaluation and the activity map indicates a good balance between passive, active and controlled, and active experiences. The outdoor experience is completely active, with children exploring and interacting with the support of caregivers, as seen in elevation sketch Fig. 6-5

The scale and spatial qualities created an enabling environment that is supported by a child-centred pedagogy. Some active and controlled aspects emerged, primarily relating to COVID-19 restrictions.

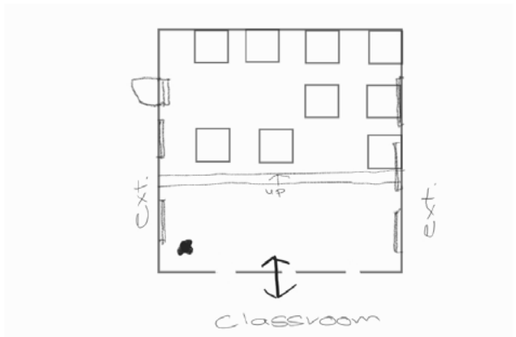
The overall evaluation of the space is that it is active, and the environments is controlled and active.

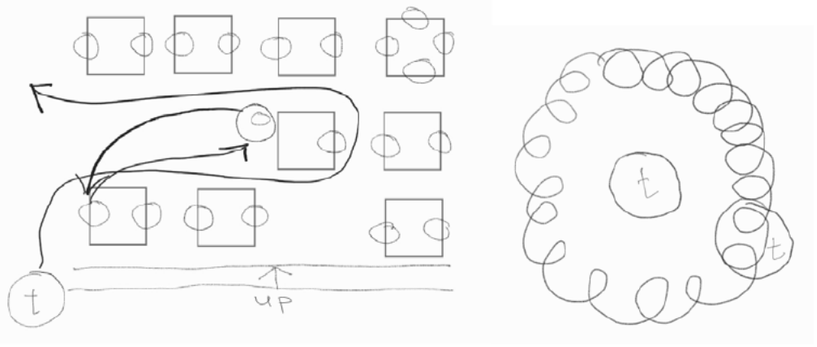
Age Group: 4 – 5
Observation Time (Classroom): 10:42 – 11:07 Observation Time (Outside): 11:35 – 11:45
17 children | 2 adults

Table 6-24 Site E2 (Age 4-5) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
	CLASSROOM	
10:42	Snack time.	
10:46	Teacher 2 enters.	
10:49	Teacher sanitises the tables.	
10:51	Child uses lunch as a play object.	
10:55	Teacher begins to hand out crayons and paper to each table.	
10:56	Teacher gives toilet paper to child.	
10:57	Children begin writing out numbers (1-5). Children at the other tables waiting in anticipation for crayons and paper.	
	OUTSIDE	
11:35	Free play on equipment.	
11:42	Teacher sings to get the attention of the children. Children in the circle begin to play with the teacher.	
11:43	Singing/dancing in a circle: "Fire on the Mountain" and "Two Red Apples".	

Figure 6-6 Site E2 (Age 4-5) Activity Map





Outside

Table 6-25 Site E2 (Age 4-5) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Two spaces within one grand room. Low partition wall divides spaces. Carpeted "stage" area with tables higher than the tiled floor area (half of one space).		Eating at tables. Blackboard learning. Learning at tables. Play/dance/sing outside.	
Interior/ Exterior Relationship	Lower volume in the "stage" area, i.e., windows are perfect height for children to have view of valley. No artificial light being used. Some natural light and ventilation.		Greater connection to the outside on the "stage" area as children are seated closer to the windowsill. High stairs may be a trip hazard.	
Movement	No movement promoted although space for adequate interior movement exists – result of COVID-19.		Upper body movements at tables. Move to bin, toilet, teacher desk, outside to bag.	
Interactions – Child/ Child and Child/ Teacher	Child/space – windows are the perfect height for child views. Tall volume counteracted by truss and "stage" area. Appropriate no. of children for the space, i.e., no crowding.		Emotionally mature interactions. Quiet talking. Listening to other class in adjacent space and answering questions quietly. Eager to participate. Teacher more involved outside.	
Potential/ Affordance	Views of valley afford learning opportunities. Volume affords difference in spaces.		Separation of spaces by stairs affords different associations for development and personalisation.	
Noise	No architectural devices to prevent sound travel.		Quiet/bored at tables. Noise travels between classrooms – distracting for children.	

Source of Tables and Figure: Author (2023)

Synthesis

The timed activity (Table 6-24) and activity maps (Fig. 6-6) show a predominant passive or controlled and active environment. Children are kept sitting at tables, with no active exploration. During the outdoor play a very brief time is provided for free exploration. Considering the age of the children and the potential of the space for active learning, the control of the environment is a contrast.

The overall evaluation indicates the space as active and the environment as controlled and active.

Age Group: 0 – 2

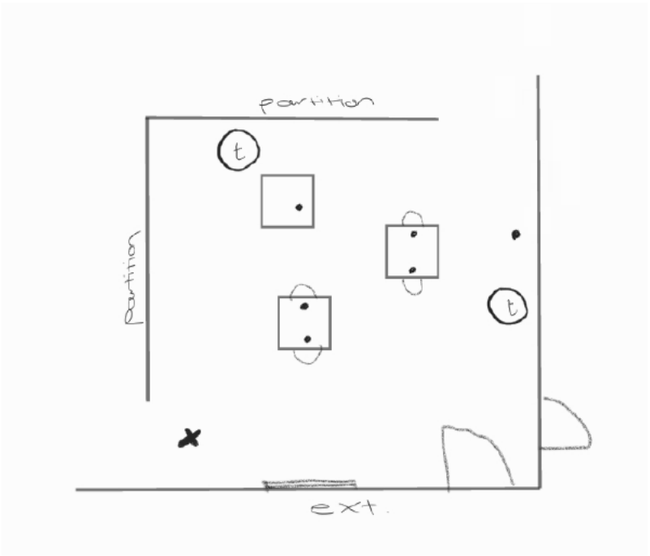
Observation Time: 10:12 – 10:45

6 children | 1/2 adults

Table 6-26 Site E3 (Age 0-2) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
10:12	Snack time.	
10:35	Teacher takes a child to toilet. Child runs back to the chair.	
10:38	Baby walks into another classroom. Teacher cuts an orange for a child.	
10:39	Baby walks into other class to see what's going on.	
10:42	Baby walks into other class.	
10:45	Teacher takes baby to toilet to change diaper.	

Figure 6-7 Site E3 (Age 0-2) Activity Map



Source of Tables and Figure: Author (2023)

Table 6-27 Site E3 (Age 0-2) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Multiple spaces within one grand room. Low partition walls divide the spaces.		Eating at the tables. Sleeping on pillows.	
Interior/ Exterior Relationship	Windows on either side of the classroom impeded by partition walls and furniture. Low volume – some natural light and ventilation. View of sloped garden and road above. View of valley impeded by furniture.		Little connection to the outside. Some drawn to movement outside the window – can see cars driving past and parking.	
Movement	No movement promoted, although movement across classrooms occurs. Only one point of access.		Towards other class – listening/watching. To the toilet. Waddles/hops/dances/stomps.	
Interactions – Child/ Child and Child/ Teacher	Child/space – windows are inappropriate for child views. Low volume appropriate for children. Somewhat appropriate no. of children for the space, i.e., some crowding.		Minimal interactions. Interact with the teacher/care giver. Child takes another child's food and drops it on the floor. Sharing of food. Respond to the teacher.	
Potential/ Affordance	Low volume affords safety and comfort.		Very restrictive environment. Free play not afforded. Running around tables.	
Noise	No architectural devices to prevent sound travel. Views afford learning opportunities.		Crying baby. Noise from adjacent classroom is distracting.	
Overall				

Synthesis

The evidence from the timed activity indicates active exploration by one child; however, the activity map (Fig. 6-7) shows that the other children remain passive. Similarly, the evaluation of the space and environment drawn from the data indicates that the children are contained to their chairs, leading to a rating of no activity.

The overall evaluation indicates that the space is controlled and active and the environment is passive.

Age Group: 3 – 5

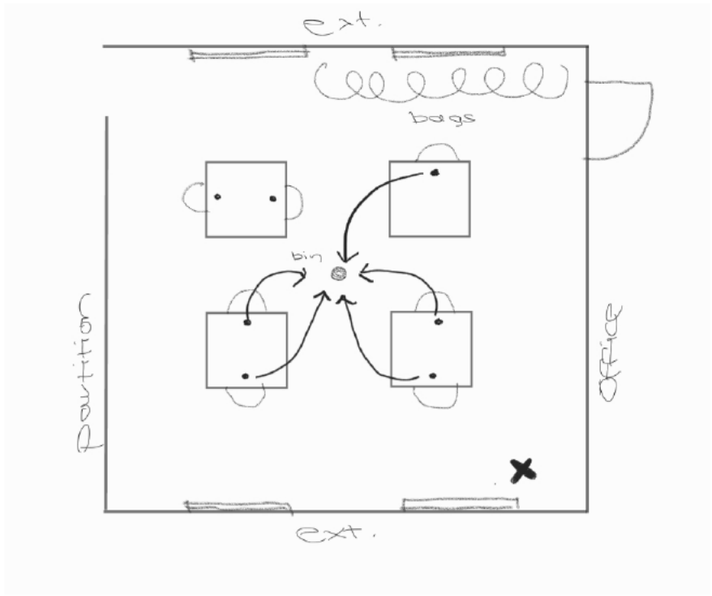
Observation Time: 09:43 – 10:23

7 children | 1 adults

Table 6-28 Site E3 (Age 3-5) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
09:43	Teacher arranges tables and chairs. Two children per table.	
09:46	Teacher sanitises tables and hands.	
09:49	Teacher removes snacks from each school bag for the children.	
09:54	Snack time continues.	
09:57	Teacher moves tables through the space to the younger group.	
10:02	Teacher hands out “covid hats”.	
10:17	Sing “Hello, How are You?”	
10:19	Learn about the days of the week and months of the year.	
10:21	Learn about numbers.	
10:23	Learn about shapes and the alphabet.	

Figure 6-8 Site E3 (Age 3-5) Activity Map



Source of Tables and Figure: Author (2023)

Table 6-29 Site E3 (Age 3-5) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Multiple spaces within one grand room. Low partition walls divide the spaces.		Sitting at the tables/chairs. Eating at the tables. Sing/dance in the “covid square”.	
Interior/ Exterior Relationship	Windows on either side of the classroom impeded by partition walls and furniture. Low volume – some natural light and ventilation. View of the sloped garden and road above. View of the valley impeded by the furniture.		Little connection to outside. Feels claustrophobic with the windows closed.	
Movement	No movement promoted although movement across the classrooms occurs. Only one point of access.		To tables/bin/teachers/bags. Reserved movements.	
Interactions – Child/ Child & Child/ Teacher	Child/Space – windows are inappropriate for child views. Low volume appropriate for children. Somewhat appropriate no. of children for the space, i.e., some crowding.		Quiet murmuring to friends at the tables. Teacher strict/quiet. Minimal talking – the teacher quietens the children. Answer questions. Mainly isiZulu spoken – some English.	
Potential/ Affordance	Low volume affords safety and comfort. Views afford learning opportunities.		Very restrictive environment. Free play not afforded, although space for free play. Hard surfaces.	
Noise	No architectural devices to prevent sound travel.		Quiet in comparison to the adjacent class. Noise from the adjacent classroom is distracting.	

Synthesis

The evidence from the evaluation of the timed activity, activity map, and the space and environment’s potential was concluded as passive. The finding can be attributed to the limitations of the spatial arrangement and qualities compounded by a teacher-centredness and the impact of COVID-19 restrictions.

6.5.4. SITE E4

Age Group: 2 – 3

Observation Time: 10:03 – 10:38

10 children | 1/2 adults

Table 6-30 Site E4 (Age 2-3) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
10:03	Sitting in "covid squares" – distanced and wearing masks.	
10:06	Teacher sits down on the chair.	
10:10	Teacher tells children to stay in "covid squares".	
10:11	Child calls to the teacher as she's walking past. Teacher hugs the child.	
10:12	Snack time.	
10:13	Child cries when teacher 1 leaves.	
10:18	Teacher 2 facilitates snack time.	
10:21	Teacher 1 feeds some children.	
10:24	Teacher 3 feeds some children.	
10:25	Child uses wall to kick legs up into a handstand.	

Figure 6-9 Site E4 (Age 1-2) Activity Map

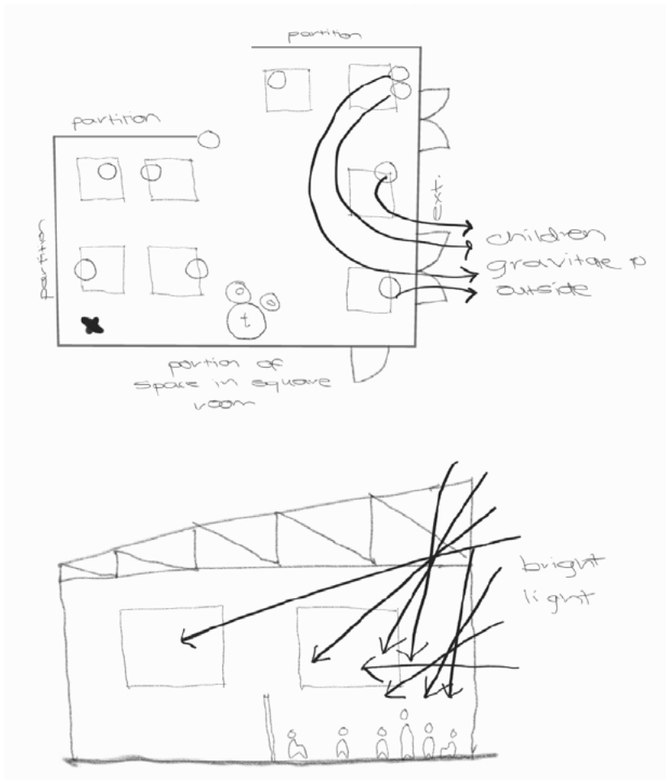


Table 6-31 Site E4 (Age 2-3) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Multiple spaces within one grand room. Low partition walls divide the spaces. Potential for range of activities		Sitting/eating in the "covid squares".	
Interior/ Exterior Relationship	Windows on three sides of the room. High volume and double door – natural light and ventilation. Covered patio outside (clear roofing material) – unimpeded natural light enters the classroom. View of the covered patio.		Feel a connection to the outside. Some children sit near the window and gravitate towards the outside when the doors open. Most stay distanced in the "covid square".	
Movement	No movement promoted. Children are restricted to "covid squares".		Minimal, reserved movement. Some children pass through the classroom to go outside. Gravitate towards the openings.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – windows are appropriate for child views. Tall volume counteracted by the truss. Somewhat appropriate no. of children for the space, i.e., some crowding.		isiZulu/English spoken. Talk across the "covid squares". Attentive/responsive to the teacher. Children seem unstimulated during snack time.	
Potential/ Affordance	Tall volume and exposed truss afford hanging/climbing elements.		Doors need to be open to afford free outdoor play. Blank walls afford play (handstands).	
Noise	No architectural devices to prevent sound travel.		Very quiet – children only talk to the teacher. Noise from other classes in the space.	
Overall				

Source of Tables and Figure: Author (2023)

Synthesis

The evaluation from the timed activity and map indicates predominantly passive learning. Notably, the space evaluation indicates the potential for active exploration provided by the scale, arrangement, qualities, and volume of the space. The environment measures as predominantly controlled and active, with limitations to the children's movements and minimal displays that can be attributed to covid restrictions.

Age Group: 4 – 5

Observation Time (Classroom): 10:31 – 10:53 Observation Time (Outside): 10:53

11 children | 2 adults

Table 6-32 Site E4 (Age4-5) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
	CLASSROOM	
10:31	Snack time. Teacher walks around cutting apples for the children.	
10:42	Teacher watches over the children eating.	
10:46	Teacher sanitises the tables.	
10:47	Noise levels increase as the children finish their food.	
10:50	Teacher asks the children to be quiet.	
10:51	Girls stand up and line up.	
10:52	Boys stand up and line up.	
10:53	Children sing a song and walk outside.	
	OUTSIDE	
10:54	Children dispersed on the jungle gym and play equipment.	

Figure 6-10 Site E4 (Age4-5) Activity Map

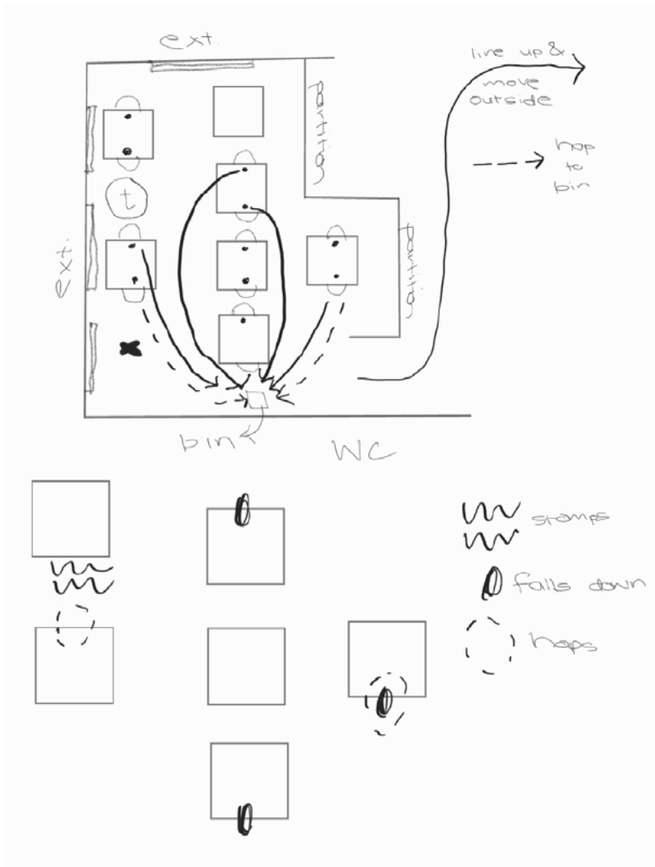


Table 6-33 Site E4 (Age4-5) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Multiple spaces within one grand room. Low partition walls divide the spaces. Potential for a range of activities		Eating at the tables. Play outside.	
Interior/ Exterior Relationship	Windows on three sides of the room. High volume – natural light and ventilation. View of the vegetable garden. View of the outdoor play area impeded by furniture.		Feel a connection to the outside. Children excited to line up and go outside.	
Movement	Snaking movement in and around partitions to get out of the room and into the outdoor play area. Circular movement promoted within the classroom space.		To the bin, to the toilet, and back to table. Hopping/walking/stomping/ running/dancing to the bin – playful movements. Falling off the chairs around the tables.	
Interactions – Child/ Child the Child/ Teacher	Child/Space – windows are perfect for child views. Tall volume counteracted by truss. Somewhat appropriate no. of children for space, i.e., some crowding.		Copy the movements of friends (falling). Talk among the friends at the tables. Desperate for attention and activity. Bored. Teacher is firm/strict/tired.	
Potential/ Affordance	Tall volume the exposed truss affords hanging/ climbing elements. Views of the garden afford learning opportunities.		Children afforded play through everyday activities, i.e., sitting and walking to the bin/toilet.	
Noise	No architectural devices to prevent sound travel.		Noise from other classes in the space. Outside play area next to the classroom.	
Overall				

Source of Tables and Figure: Author (2023)

Synthesis

The timed activity indicates predominantly passive learning; however, the activity map shows individual children's movements at their table and in the space. The space and environmental evaluation confirm the potential for active engagement, which is generally limited by the covid restrictions.

The overall evaluation indicates the space as active and the environment as controlled and active.

Age Group: 5 – 6

Observation Time (Classroom): 11:02 – 11:06 Observation Time (Classroom): 11:51 – 12:01

6 children | 1 adults

Table 6-34 Site E4 (Age5-6) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
11:02	Teacher sanitises the tables.	
11:03	Children prepare to play outside. Children put on shoes.	
11:06	Outside play time.	
	Researcher completes children participation during this time.	
11:45	Children come inside.	
11:51	Children stand up behind their chairs. Jump 10 times. Clap 20 times.	
11:54	Continue song and dance time: "Hip-hip Hooray!" song. "Down by the station". "Ba Ba Black Sheep". "Twinkle Twinkle Little Star". "Little Monkeys".	
12:01	Sing the story time song. Teacher begins story time about occupations (theme).	

Figure 6-11 Site E4 (Age5-6) Activity Map

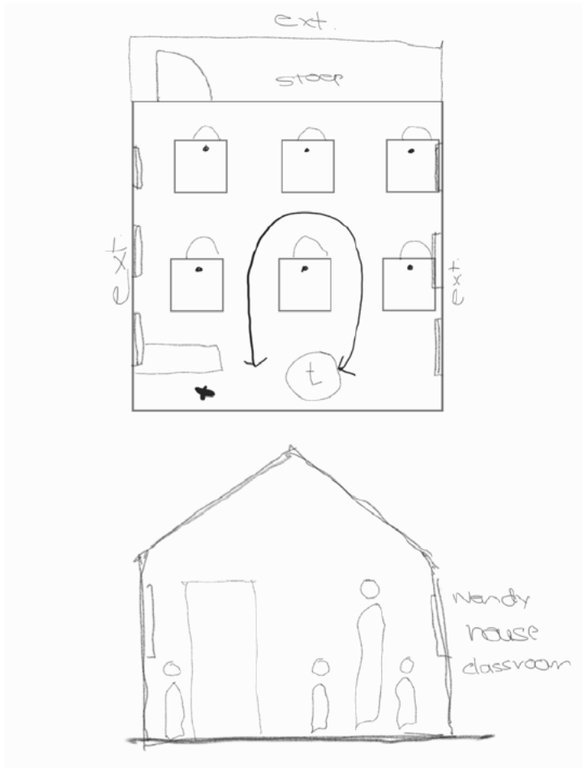


Table 6-35 Site E4 (Age5-6) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Wendy house standalone structure. All activities occur in one square room.		One child per table. Learning at the tables. Jumping/ clapping/ dancing.	
Interior/ Exterior Relationship	Windows on either side of the room. Low volume – natural light and ventilation. View of the outdoor play area and garden.		Connected to the surrounding context. Children aware of their surroundings.	
Movement	Circular movement promoted within the classroom space – only one point of access.		On the spot – behind tables. Music inspires movement time. Clapping/dancing/jumping – love to move around.	
Interactions – Child/ Child and Child/ Teacher	Child/space – windows are perfect for child views. Low volume appropriate for children. Appropriate no. of children for the space i.e. no crowding. Typical "house" structure.		Talk across the room and this fills the room. Attentive/responsive to the teacher. Answer questions. Curious. isiZulu and English spoken.	
Potential/ Affordance	Views of the garden afford learning opportunities.		Very small but unattached & undisturbed by the other classes. "House" structure affords development of positive associations between the school and home.	
Noise	Standalone structure prevents noise from disturbing other classes.		Bubbly/excitable. Noise from the outside play area next to the classroom.	

Source of Tables and Figure: Author (2023)

Synthesis

The timed activity is active (getting ready and going outside) and controlled and active while the activity map and sketch show the inherent limitations of the space, arrangement, and scale. The evidence relating to the space and environment confirms a slight contradiction between the positive spatial qualities and affordances. A further factor leading to a more controlled environment is the age range and requirements for formal learning at Grade R level.

The overall evaluation indicates the space as active and the environment as passive.

6.5.5. SITE E5

Age Group: 0 – 1.5
Observation Time: 10:08 – 10:29
7 children | 1/2 adults

Table 6-36 Site E5 (Age 0-1.5) Potential of Timed Activity

TIME	ACTIVITY	
10:08	Sleeping/feeding time. Playing time for some.	
10:13	Care giver changing a diaper. Care giver walks around with the baby to soothe her/him.	
10:16	Door to the adjacent classroom opens. Children walk into the adjacent classroom. Teacher calls the children back inside.	
10:20	Children from the adjacent classroom enter and talk to the care giver.	
10:24	Child comes back into the class after walking out almost 10 minutes ago.	
10:29	Teacher helps the children to sanitise their hands before snack time.	

Figure 6-12 Site E5 (Age 0-1.5) Activity Map

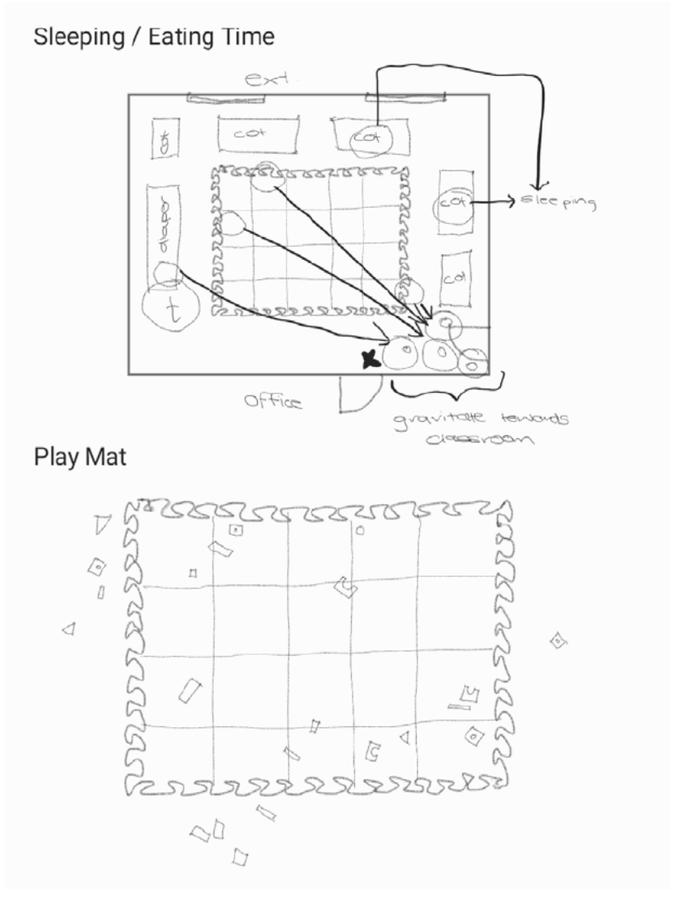


Table 6-37 Site E5 (Age 0.1.5) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Carpeted area with cribs. Foam puzzle mats.		Eating/sleeping/playing on the carpet and foam puzzle mats.	
Interior/ Exterior Relationship	Two small windows on one side. Low volume – almost no natural light and ventilation. No exterior views. Bright artificial light.		No connection to the outside. Blinds over the windows impede the exterior view.	
Movement	No movement promoted, although movement across classrooms occurs.		Crawling/stumbling towards the adjacent classroom. Sit by the door and watch the older children.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – windows are inappropriate for child views. Low volume appropriate for children. Appropriate no. of children for the space, i.e., no crowding.		Attached to adult presence. One child plays independently. Some respond to the care giver. isiZulu spoken.	
Potential/ Affordance	Low volume affords safety and comfort.		Foam puzzle mats/carpet afford a difference in the play space.	
Noise	Closed door to prevent sound travel. 220 b/w wall between the classrooms.		Loud – crying/screeching. Noise from the adjacent classroom if the door is open – distracting.	

Source of Tables and Figure: Author (2023)

Synthesis

The evaluation of both the timed activity and the mapping indicates that active learning is encouraged, although the map also shows the requirement for sleeping for this age range. The spatial qualities contradict the active evaluation, while the environment provides evidence that engagement is still achieved within the restrictions of the space.

The overall evaluation concludes the space as passive and the environment as active.

Age Group: 2 – 3
Observation Time: 10:36 – 11:05
9 children | 2 adults

Table 6-38 Site E5 (Age 2-3) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
10:36	Snack time. Teachers/ care givers in and out of the class.	
10:47	Children pack their lunch boxes away in their bags.	
10:50	Boys tuck in their shirts. Staff begin to place toy bikes outside on the patio.	
10:54	All children move towards the door to see the bikes. Teacher sanitises the tables. Older children from other classroom go outside to play on bikes.	
10:56	Children line up to go outside. Play time outside at the same time as other class, but in a different area.	

Figure 6-13 Site E5 (Age 2-3) Activity Map

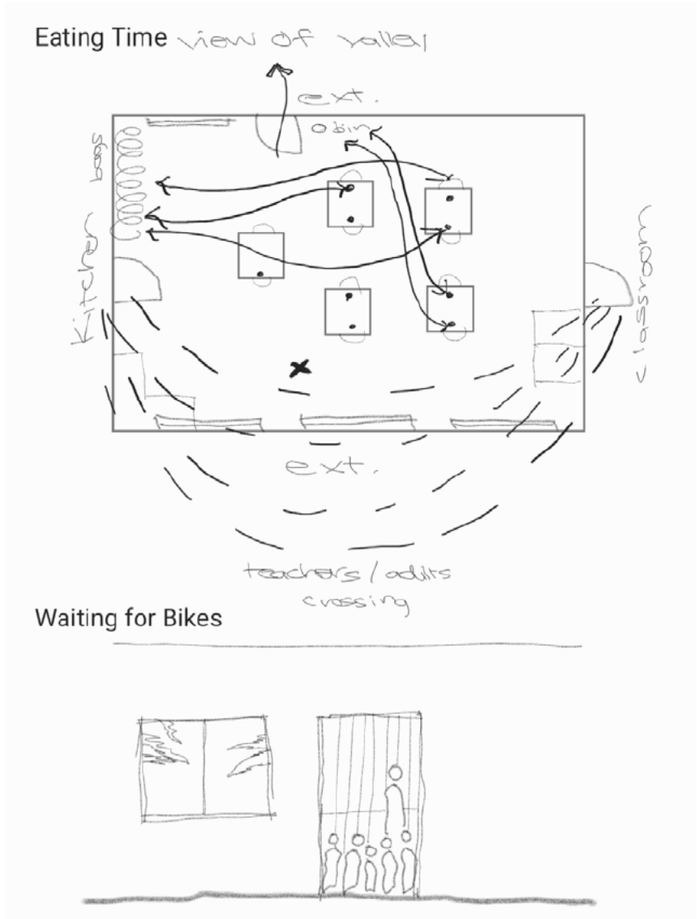


Table 6-39 Site E5 (Age 2-3) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Carpeted area. Moveable furniture. Reading area.		Eating at the tables. Playing outside.	
Interior/ Exterior Relationship	Windows on either side of the classroom. Low volume – some natural light and ventilation. View of the play area (through the door). Bright artificial light.		Little connection to the outside. Blinds over the windows impede the exterior view. Children gravitate to the open door when the bikes are set up. Connected to the context when outside.	
Movement	Linear and multidimensional movement promoted – three points of access. Movement across the classroom can be distracting.		Slow movements to the bags/bin. Waddling/walking/dancing/ climbing. Up rope and down slide. Swinging each other outside.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – windows are appropriate for child views but impeded by blinds and shelves. Low volume appropriate for children. Appropriate no. of children for the space, i.e., no crowding.		See-through screen between the children at the tables. Attentive/responsive to the teacher. Answer questions.	
Potential/ Affordance	Low volume affords safety and comfort. Views afford learning opportunities.		Large space affords diverse play opportunities.	
Noise	Closed door to prevent sound travel. 220 b/w wall between the classrooms.		Noise from the adjacent classroom if the door is open – distracting.	

Source of Tables and Figure: Author (2023)

Synthesis

The timed activity, along with the activity map and sketch, show active learning to be encouraged. In contrast, the space and environment are more controlled by inappropriate features and covid restrictions.

The overall evaluation indicates both the space and environment as controlled and active.

Age Group: 3 – 4
Observation Time (Classroom): 11:40 – 11:55 Observation Time (Outside): 11:08 – 11:40
18 children | 2 adults

Table 6-40 Site E5 (Age 3-4) Potential of Timed Activity

TIME	ACTIVITY	
	OUTSIDE	
11:08	Outside play in groups: Some on bikes. Some play games with hula hoops and play equipment.	
11:15	Play equipment group run to the bikes on the driveway. Sing "itoyitoyi".	
11:18	Races on the driveway – 3 children at a time. Others do push-ups under the tree.	
11:22	Child falls and cries. Teacher takes the child away to clean them up.	
11:27	Teacher and students bring two cups and a bucket of water out for the children.	
11:30	Children play soccer.	
11:40	Children & teachers pack away the play equipment to go inside.	
	CLASSROOM	
11:45	Sanitise hands inside.	
11:48	Story time and a song. Teacher reads a story.	
11:54	Comprehension questions in isiZulu.	

Figure 6-14 Site E5 (Age 3-4) Activity Map

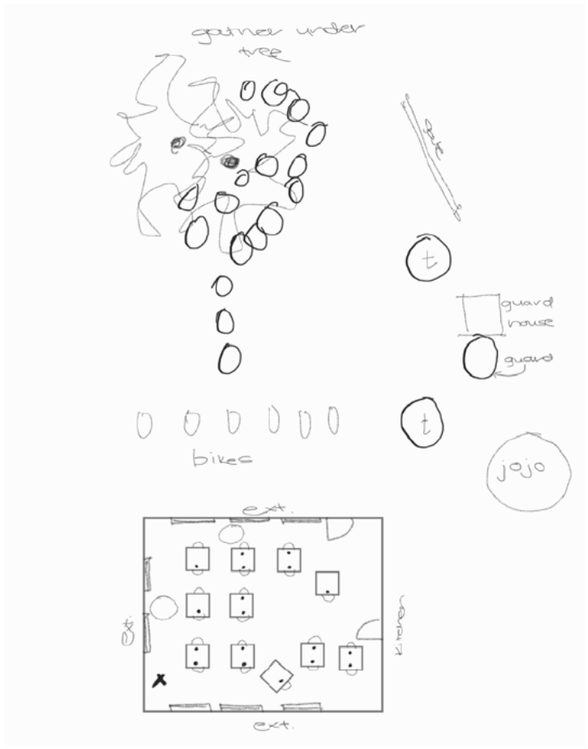


Table 6-41 Site E5 (Age3-4) Potential of Space and Environment

	SPACE		ENVIRONMENT	
Activities	Moveable furniture. Carpeted interior. One space		See-saw, ball games, hula hoops, bikes, running, and sandcastles outside. Sit at the tables.	
Interior/ Exterior Relationship	Windows on either side of the classroom. Low volume – some natural light and ventilation. Comfortable with the lights off, but still a bit dark.		Little connection to the outside. Blinds over the windows impede the exterior view. Connected to the context when outside.	
Movement	Circular movement promoted. Two points of access, but one is from the kitchen.		Energetic during play time. Excited. Barefoot. Run around the tree on the driveway.	
Interactions – Child/ Child and Child/ Teacher	Child/space – windows are appropriate for child views but impeded by blinds and shelves. Low volume appropriate for children. Somewhat appropriate no. of children for the space, i.e., some crowding.		isiZulu spoken. Independent play and joint play. Engage with other students. Listen/respond to the teacher. isiZulu stories.	
Potential/ Affordance	Low volume affords safety and comfort. Views afford learning opportunities.		Running/racing on the driveway. More light than the other rooms, but also more children.	
Noise	Closed door to prevent sound travel. 220 b/w wall between the classrooms		Well-behaved. Only talk when asked questions	

Source of Tables and Figure: Author (2023)

Synthesis

The timed activity and mapping show the contrast between the predominantly passive interior activities and the active outdoor play. The active nature of the outdoor areas can be attributed to the scale and range of features, both natural and manufactured. The spatial qualities pose restrictions, while the environment evaluation reflects the outdoor qualities.

The overall evaluation of the space is determined as passive, while the environment is determined as active. Note that the outdoor area was included in the data.

Age Group: 3 – 5
Observation Time (Classroom): 09:55 – 10:10 Observation Time (Outside): 11:06 – 11:11
6 children | 2 adults

Table 6-42 Site E6 (Age 3-5) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
	CLASSROOM	
09:55	Teacher discusses animals.	
10:04	Teacher makes animal sounds. Children make animal sounds.	
10:05	Teacher asks the children to be quiet. Children pack away the hula hoops.	
10:06	Children line up to go outside. Three children go outside to play games.	
10:07	Teacher arranges the tables and chairs. One child per table.	
10:08	Teacher starts a colouring lesson with three children in the class.	
10:09	Teacher hands out crayons to each table.	
10:10	Colouring time.	
	OUTSIDE	
11:06	Snack time on the stairs outside.	
11:11	Play time on the jungle gym once the snacks are finished.	

Figure 6-15 Site E6 (Age 3-5) Activity Map

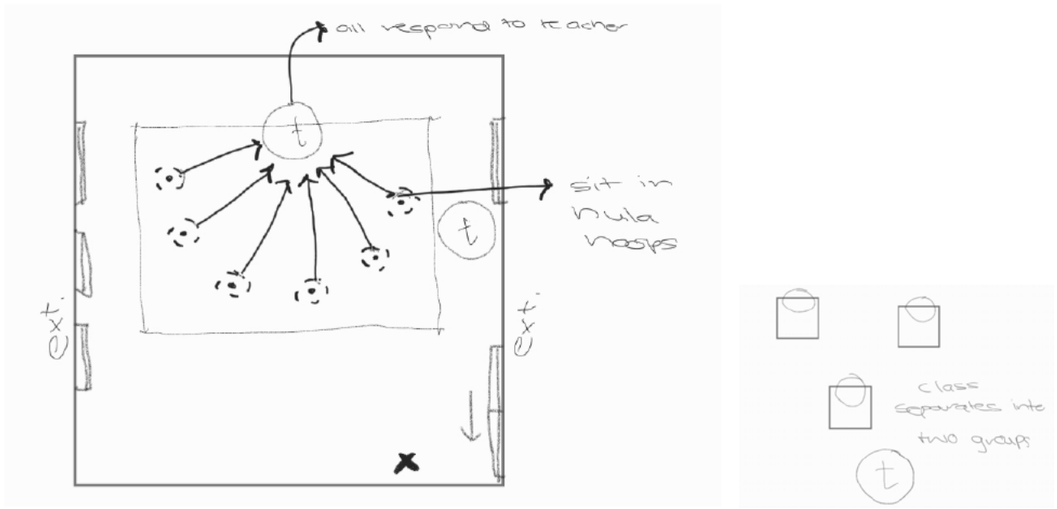


Table 6-43 Site E6 (Age 3-5) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Moveable furniture designates activity, i.e., the tables, chairs, hula hoops. Materiality used to designate activity. Carpeted interior. Astro turf play area.		Sitting/learning in hula hoops on the carpet – distanced. Eating/playing on the stairs outside. Playing on the jungle gym.	
Interior/ Exterior Relationship	Windows on either side of the room. Low volume and double door – natural light and ventilation. Covered patio outside View of the covered patio and play area. View of the valley from the outdoor play area.		Feel a connection to the outside. Some children look out of high window and see the roof truss. Child sees the reflection of dog in the window and points to it.	
Movement	Circular movement promoted, only one point of access. Circular movement promoted within the containers that enclose the ECD centre.		Subdued/restricted inside. Movement time on unicycles outside. Move to the kitchen and the covered patio to play. Play in the shaded area of the jungle gym – imaginary play.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – windows are inappropriate for child views (too high) but the sliding door allows a view of the play area. Low volume appropriate for the children. Appropriate no. of children for the space, i.e., no crowding.		isiZulu spoken. One child speaks English. Attentive/responsive to teacher. Answer questions. Speak across the age groups. Play charades with each other.	
Potential/ Affordance	Views afford learning opportunities. Large, covered patio affords free play.		Doors need to be open to create inside/outside space. Too small inside to afford free play. Covered play area.	
Noise	Insulated container architecture.		Serene/calm. No noise from the adjacent classrooms – only one class. Rooster calls.	

Source of Tables and Figure: Author (2023)

Synthesis

The timed activity shows a predominantly passive atmosphere, where activity is teacher-directed and remains controlled. The mapping confirms the passive evaluation. In contrast, the spatial qualities of the environment created indicate and overall evaluation of an environment that is active.

6.5.7. SITE H1

Age Group: 1 – 2
Observation Time: 09:05 – 09:31
16 children | 3 adults

Table 6-44 Site H1 (Age 1-2) Potential of Time Activity

TIME	ACTIVITY	Evaluation
09:05	Prayer.	
09:06	Snack time.	
09:14	Care giver brings more food.	
09:16	Pack away tables and chairs. Children from table 1 begin running around.	
09:20	Children looking outside the windows at the corridor and playground beyond. Play time. Teacher puts Lego out on carpet – only ten children allowed to play on the carpet (the others move to a different space).	
09:27	Care giver brings more toys – children scream in excitement. Teacher turns the music on.	

Figure 6-16 Site H1 (Age 1-2) Activity Map

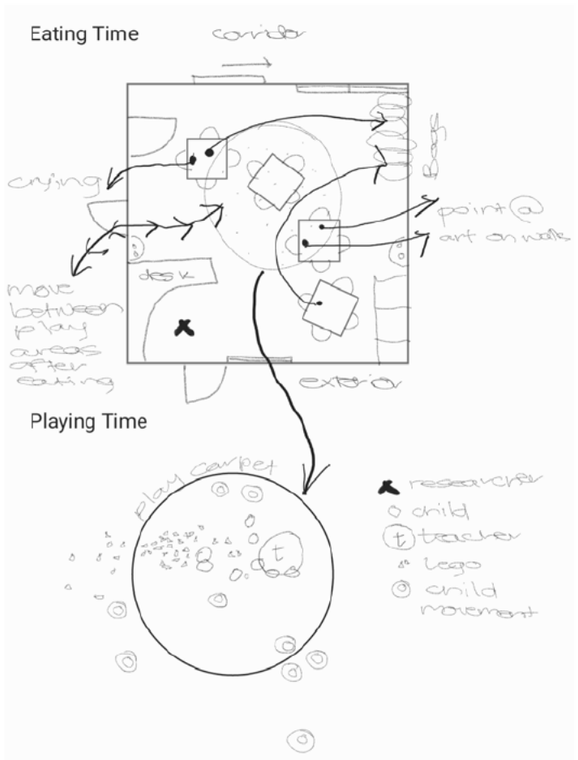


Table 6-45 Site H1 (Age 1-2) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Materiality used to designate activity.		Eat at the tables. Play on the circular carpet.	
Interior/ Exterior Relationship	Windows on either end of the classroom – natural light and ventilation. Uncomfortable bright, fluorescent, artificial lighting. View of the corridor and the playground beyond. View of the garden/retaining wall.		Look outside often. Some glued to the window, indicating eagerness to be outside.	
Movement	Linear movement promoted – openings on either side. Space limitation affects movement.		Erratic. Move between the various play areas.	
Interactions – Child/ Child and Child/ Teacher	Child/space – intimidating tall volume (counteracted by hanging lights). Understanding of spatial functions associated with materiality, i.e., carpets, tables, etc. Somewhat appropriate no. of children for the space, i.e., some crowding.		Friends and foes. Copycats. Love teacher and care givers, often gathering around the teacher during play time.	
Potential/ Affordance	Tall volume affords climbing/ hanging elements.		Designated areas for activity zones allow for associations to develop with space. Carpets (rectangular and circular) = play. Views (of playground/corridor/ garden) = explore.	
Noise	Sound insulation panels prevent echo and noise from the other classrooms.		Loud. No noise from other classrooms.	

Source of Tables and Figure: Author (2023)

Synthesis

The evaluation of the timed activities, mapping, and the space and environment, both individually and collectively, indicates that active engagement and exploration is encouraged. The evidence shows a child-centred pedagogy and a more relaxed approach to COVID-19 restrictions, where children are not confined to a certain area. Limitations noted include the scale of the room and the layout impacting on movement.

Age Group: 2 – 3
Observation Time: 09:36 – 10:01
15 children | 2 adults

Table 6-46 Site H1 (Age 2-3) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
09:36	Snack time.	
09:42	Teacher turns music on: "Ba Ba Black Sheep". Calm singing.	
09:44	Slowly move from the tables to the play carpet (some still eating).	
09:47	Children on the carpet wait for the "treasure box" announced by the teacher.	
09:50	Teacher puts clothes/bags out the on rectangular carpet for a game of dress-up. Girls stand up and choose clothes. Play time.	
09:52	Teacher puts fluffy toys on the circular carpet.	
09:57	Teacher takes pictures of the children playing.	
10:01	Children talk to the teacher in between playing – story telling. Care giver packs up the tables and chairs.	

Figure 6-17 Site H1 (age2-3) Activity Map

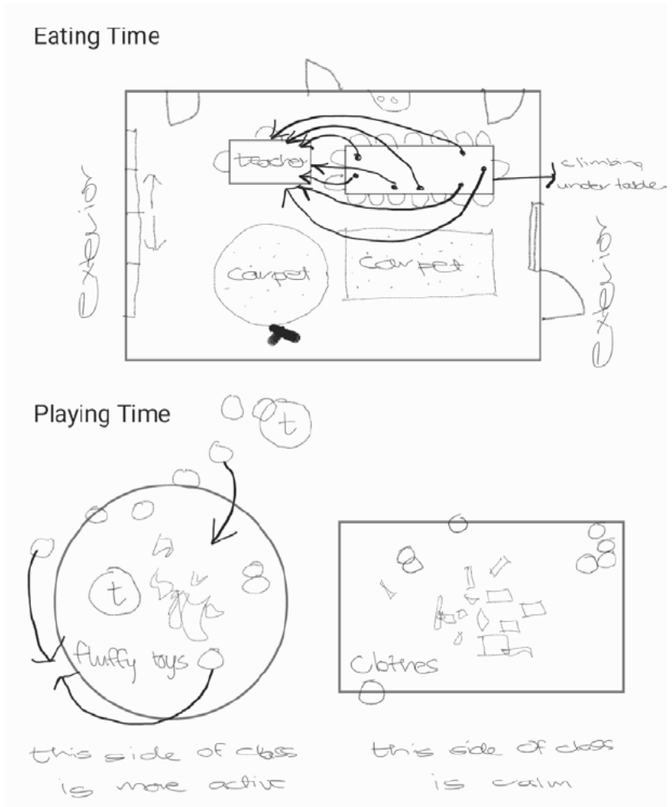


Table 6-47 Site H1 (Age 2-3) Potential of Space and Environmental

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Materiality used to designate activity.		Eat at tables. Play on circular and rectangular carpets.	
Interior/ Exterior Relationship	Windows on either end of the classroom – some natural light and ventilation. Uncomfortable, bright, fluorescent, artificial lighting. View of corridor and playground deliberately impeded by furniture. View of the garden/retaining wall.		Some play by window. Many are unaffected by outside life during play time.	
Movement	Circular movement promoted – openings on either side – to prevent children from running to their parents.		Controlled and thoughtful movements. Fun crawling/rolling/climbing/ trotting.	
Interactions – Child/ Child & Child/ Teacher	Child/Space – intimidating tall volume (counteracted by hanging artwork across the space). Understanding of spatial functions associated with materiality, i.e., carpets, tables, etc. Appropriate no. of children for the space, i.e., no crowding.		No distancing during eating and play time. Close friends. Listen to the teacher obediently. Independent – don't depend on the teacher's presence.	
Potential/ Affordance	Tall volume affords climbing/ hanging elements. Large rectangular room affords ample play, imagination, and solitary space.		Designated areas for activity zones allow for associations to develop with the space. Carpets (rectangular and circular) = play. Expansive space allows for imagination, play, and running around on rainy days.	
Noise	Sound insulation panels prevent echo and noise from the other classrooms.		Loud during play time. No noise from the other classrooms.	

Source of Tables and Figure: Author (2023)

Synthesis

The evaluation of the timed activities, mapping, and the space and environment, both individually and collectively, indicates that active engagement and exploration are encouraged. The evidence shows a child-centred pedagogy and a more relaxed approach to covid restrictions, where children are not confined to a certain area. However, some spatial mechanism is included to contain the exploration within a designated learning area.

Age Group: 3 – 4
Observation Time: 10:06 – 10:31
20 children | 2 adults

Table 6-48 Site H1 (Age 3-4) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
10:06	Play time. Individual assessments with the teacher at the desk. Teacher asks children to sit down.	
10:15	Teacher asks the children to sit down. Student teacher leaves the classroom.	
10:18	Student teacher returns to the classroom.	
10:20	Student teacher receives hugs in the reading corner.	
10:21	Table 4 packs away the wooden blocks and moves to the carpet to do puzzles.	

Figure 6-18 Site H1 (Age 2-3) Activity Map

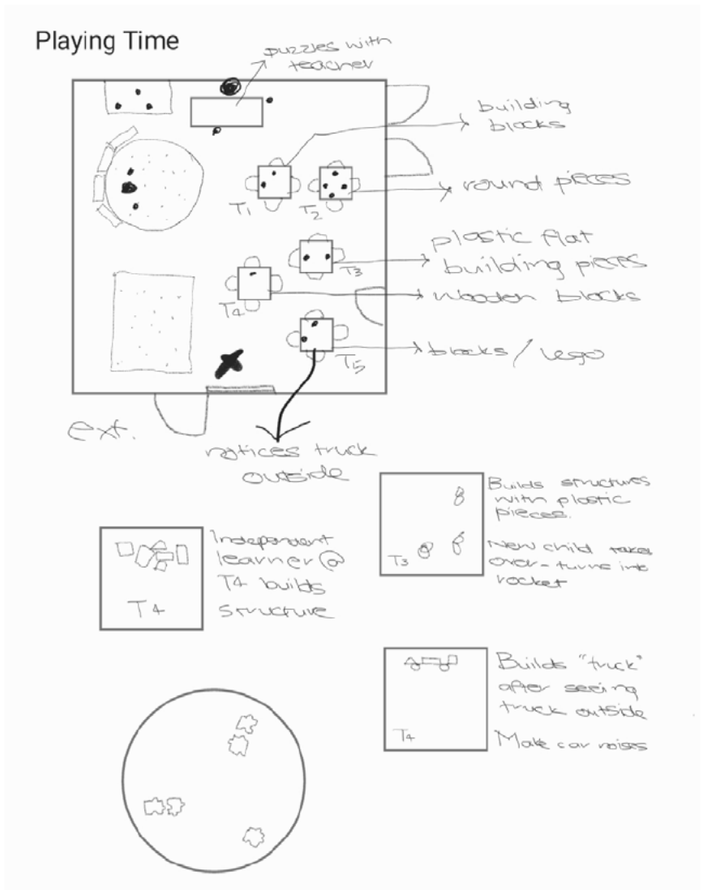


Table 6-49 Site H1 (Age 3-4) Potential Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Materiality used to designate different activities.		Play at the tables. Play on the circular and rectangular carpets. Play in the reading corner.	
Interior/ Exterior Relationship	Windows on one end of the classroom – some natural light and ventilation. View of the road in the distance. Large, spacious classroom affected by the interior design of the space, i.e., tables, carpets, reading corner.		Some play by the window and look out the window. One child sees a truck outside the window, points to it, and then builds a truck out of the wooden blocks.	
Movement	No movement promoted (on rainy day) as the furniture and materials are used to designate the inside activity.		Some move during play time. Most stay at the designated play table and are asked to stay in place.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – intimidating tall volume. Hierarchy asserted with placement of the teacher's desk at the front of the classroom. Understanding of the spatial functions associated with materiality, i.e., carpets, tables, etc. Appropriate no. of children for the space, i.e., no crowding.		Distanced – stay in table groups. Minimal interaction with the teacher as she interacts individually with the children at her desk.	
Potential/ Affordance	Tall volume affords climbing/ hanging elements. Large rectangular room affords ample play, imagination and solitary space. Organisation of the interior elements affords snaking movements. Views of the parking lot affords learning opportunities.		Designated areas for activity zones allow for associations to develop with the spaces. Promotes consistency when moving up a year. Expansive classroom allows for many play spaces and a variety of play spaces. Independent play. Controlled play.	
Noise	Sound insulation panels prevent echo & noise from the other classrooms.		Subdued sound in the classroom. No noise from the other classrooms.	

Source of Tables and Figure: Author (2023)

Synthesis

The evaluation of the timed activity found predominantly passive engagements; however, the mapping provides more details that indicate that the active exploration is still present in the micro spaces of each table and on the carpets. The more active condition is further found in the analysis of the space and environment, with limitations posed by the covid restrictions. The evidence indicates an active rating overall for both space and environment.

Age Group: 4 – 5
Observation Time (hall): 10:42 – 11:01 Observation Time (classroom): 11:06 – 11:35
+- 30 children | 3 adults 20 children | 2 adults

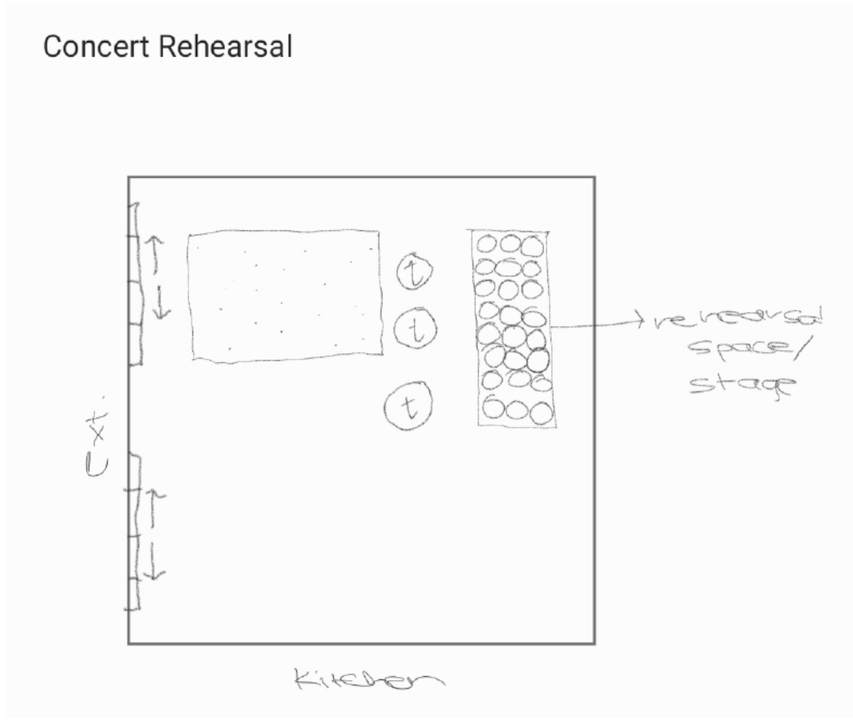
Table 6-50 Site H1 (age4-5) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
	HALL	
10:45	Concert practice in the hall. "Waka Waka" singing and dancing – most are responsive.	
10:48	"Shot Gun" singing and dancing – some yawns.	
10:52	Teacher explains the concert and the graduation protocols.	
10:55	Teacher asks the green group to line up. Exit the hall with the teacher.	
10:56	Teacher asks the yellow group to line up. Exit the hall with the teacher.	
	CLASSROOM	
11:06	Drawing time and assessments.	
11:08	Child bumps box of crayons onto the floor – many help to clean up.	
11:17	Teacher asks to finish the tracing activities. Children and the teacher pack away.	
11:18	Teacher moves chairs to the front of the classroom.	
11:23	Children line up for the "magic school bus" game. Show imaginary bus ticket to the teacher and sit down on a chair.	
11:26	School "bus trip" to the beach. Questions asked by the child "conductor": "Do you have your towel? Do you have your armbands? Do you have your sunscreen? Do you have your costume? Do you have your buckets & spades?"	
11:29	Teacher turns the music on: "Wheels on the Bus". Children sing along to the music. Teacher videos the children.	

Synthesis

The timed activity was recorded during a combined concert rehearsal in the hall space. The evidence indicates the need for more containment due to the nature of the task and larger number of children. The scale of the hall space, as shown on the activity map, is appropriate for this kind of engagement. The evaluation confirms the controlled and active nature.

Figure 6-19 Site H1 (Age 4-5) Activity Map



Source of Tables and Figure: Author (2023)

Figure 6-20 Site H1 (Age 4-5) Activity Map

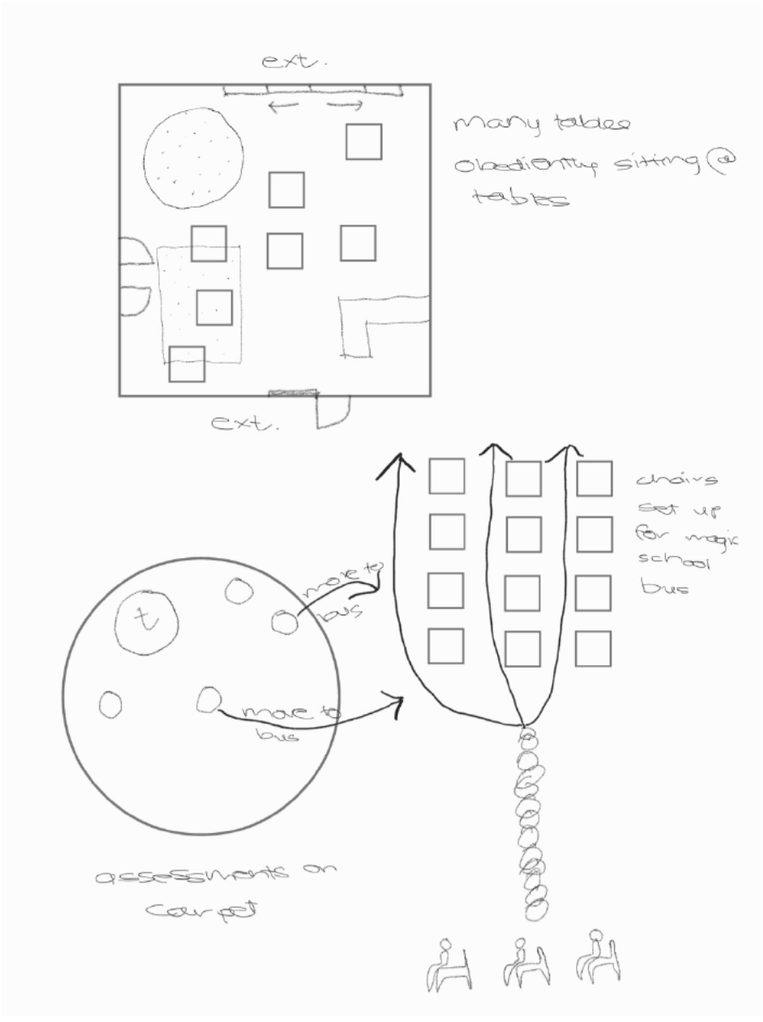


Table 6-51 Site H1 (Age 4-5) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Materiality used to designate activity.		Draw at the tables. Puzzles in the reading corner. Play at the tables and use the chairs.	
Interior/ Exterior Relationship	Windows on either end of the classroom – some natural light and ventilation. View of the playground. View of the parking lot.		All doors open – barrier between the inside/outside dissipates. Space feels less claustrophobic due to the interior design.	
Movement	Linear movement promoted – no furniture blocking the views. Free flowing movement.		Stay at the tables during drawing time. Puzzle assessments on the carpet.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – intimidating tall volume. Access to the outside world through unimpeded views. Understanding of the spatial functions associated with materiality, i.e., carpets, tables, etc. Appropriate no. of children for the space, i.e., no crowding.		Chat to friends in groups at the tables. Teacher is firm/strict sometimes. Children not attached to the teacher but still seek affirmation occasionally.	
Potential/ Affordance	Large rectangular room affords ample play, imagination, and solitary space. View of the playground affords learning opportunities.		Similar to the other classrooms, i.e., there is no room for difference or individuality (homogeneity). Similar spaces afford similar opportunities. Some independent play.	
Noise	Sound insulation panels prevent echo & noise from other classrooms.		Minimal sound in the classroom during drawing time. Chorus of noise during group imaginary play time, i.e., "magic school bus". No noise from the other classrooms.	

Source of Tables and Figure: Author (2023)

Synthesis

The activity mapping of the classroom activity shows a similar controlled and active engagement, where children were seated at their tables and this was followed by a teacher-directed activity. The evidence from the space and environment assessment contrasts with activity as the predominant evaluation, indicating the potential for active learning.

6.5.8. SITE H2

Age Group: 1 – 2
Observation Time (classroom): 08:52 – 09:19 Observation Time (activity room): 10:27
10 children | 1/2 adults

Table 6-52 Site H2 (Age 1-2) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
	CLASSROOM	
08:52	Music on – slow/soothing. Playtime with the teacher.	
08:55	Care giver/cleaner enters.	
08:56	Researcher receives a Lego piece from a child.	
08:57	Child replaces the green Lego piece with a yellow Lego piece.	
09:04	Child shouts as the care giver moves the chair. Child bangs the Lego piece on the toy house.	
09:11	Gradual shift and dispersal of children.	
09:17	Teacher sings. Some sing along.	
	ACTIVITY ROOM	
10:27	High energy exercise and movement in the space. Children are resourceful with the gym equipment. Very loud and excitable.	

Figure 6-21 Site H2 (Age 1-2) Activity Maps

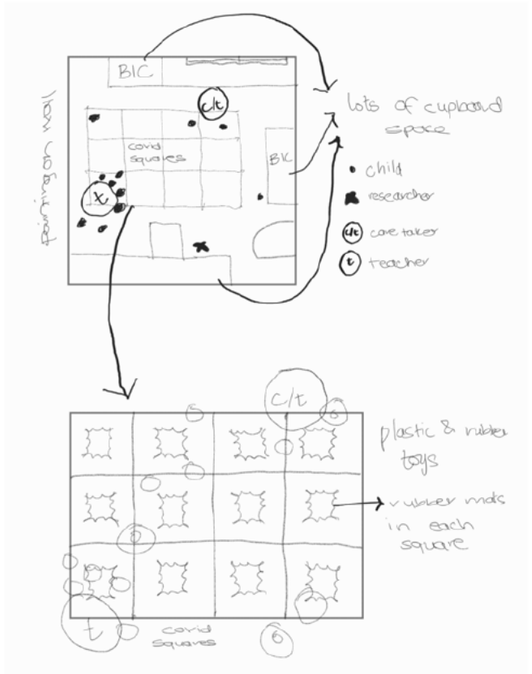


Table 6-53 Site H2 (Age 1-2) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Interior design: reading corner, wall art.		Play on carpet in the "covid squares". Play in together in the reading corner. Draw at tables.	
Interior/ Exterior Relationship	Small clerestory windows above and the door opens onto the interior corridor – almost no natural light and ventilation. No exterior views. Adjacent to the ablutions – distracting as people constantly moving past the door.		Teacher disappointed that children can't play outside on the rainy day. No connection to the outside. Children gather along the wall art wall. Feels claustrophobic.	
Movement	Small space doesn't allow big movements.		Subdued movements. Move into smaller groups on the "covid squares".	
Interactions – Child/ Child & Child/ Teacher	Child/Space – intimidating tall volume in a small square room. Somewhat appropriate no. of children for the space (for age the group) but some crowding.		Attached to the teacher/adult presence. Desperate for attention. Gather around the teacher. Not attached to other children.	
Potential/ Affordance	Tall volume affords climbing/ hanging elements.		No space for affordance.	
Noise	Closed door to prevent sound travel.		Quiet calm. Loud noise from the adjacent bathroom.	

Source of Tables and Figure: Author (2023)

Synthesis

The evaluation of the timed activity as predominantly active is confirmed by the mapping that shows engagement. Notably, the map shows greater dependence on the teacher, with several children gathered around (appropriate for the age group). The imposition of covid restrictions is not evident in the space. In contrast, the space and environment read as predominantly passive. The spatial qualities of the room with no connection to the outside area is particularly inappropriate for children's care.

Age Group: 2 – 3
Observation Time: 09:22 – 09:46
11 children | 2 adults

Figure 6-54 Site H2 (Age 2-3) Timed Activity

TIME	ACTIVITY	Evaluation
09:22	Music on – clean up time.	
09:23	Teacher asks the children to go to the "covid squares". Plays music for singing and dancing.	
09:25	Care giver cleans/sanitises the tables. Teacher sings nursery rhymes. Children sing along.	
09:26	Music off. Teacher tells a story from the Bible.	
09:32	Prayer.	
09:33	Sing a song.	
09:35	Stand up and walk on the spot.	
09:36	Prayer. Snack time.	

Figure 6-22 Site H2 (Age 2-3) Activity Map

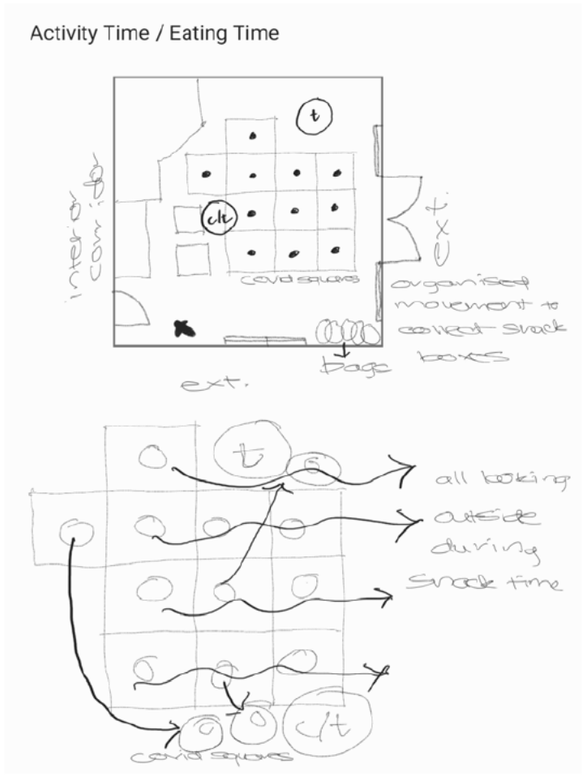


Table 6-55 Site H2 (Age 2-3) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	Foam puzzle mat in each "covid square" for children to using during snack time.		Play/sing/dance/read/eat in the "covid squares". Story time. Singing and dancing.	
Interior/ Exterior Relationship	Windows on two sides of the classroom – natural light and ventilation. Bright artificial light. View of the playground and covered patio. Doors and windows open.		Teacher disappointed that children can't play outside on the rainy day. Children looking outside during snack time.	
Movement	Restricted to the "covid square". Ease of access to the outside promotes inside/outside room.		Subdued movements. Most stay in the "covid squares". Dancing/clapping on the spot.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – intimidating tall volume (counteracted by hanging lights). Full length windows appropriate for views for the children. Somewhat appropriate no. of children for the space, i.e., some crowding (with furniture).		Teacher very involved – singing or reading constantly. Most children responsive – listen and answer questions. Almost no interaction with other children – show each other their food.	
Potential/ Affordance	Tall volume affords climbing/ hanging elements. Views of the garden afford active learning opportunities.		Classroom doesn't afford many activities – all occur in the "covid squares".	
Noise	Closed door to prevent sound travel. 220 b/w wall between the classrooms.		Quiet/calm. Music keeps the children calm.	

Source of Tables and Figure: Author (2023)

Synthesis

The evaluations of the timed activity and the mapping revealed results of passive or controlled and active. The finding can be ascribed to the covid restrictions and slight teacher-centredness. The evidence from the space analysis includes some active potential. However, the environments are predominantly controlled, leading to an overall rating for both space and environment as controlled and active, even though the spatial qualities include a good connection between the inside and outside areas.

Age Group: 3 – 4
Observation Time: 09:51 – 10:14
7 children | 2 adults

Table 6-56 Site H2 (Age 3-4) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
09:51	Music on – calm/ soft. Story and snack time.	
10:01	Teacher tells another story that lasts long – children lose attention.	
10:07	Children pack away their lunch boxes. Wash hands outside.	
10:10	Children take sensory trays to the "covid squares". Some use pairs of tweezers and some use hands to play.	

Figure 6-23 Site H2 (Age 3-4) Activity Map

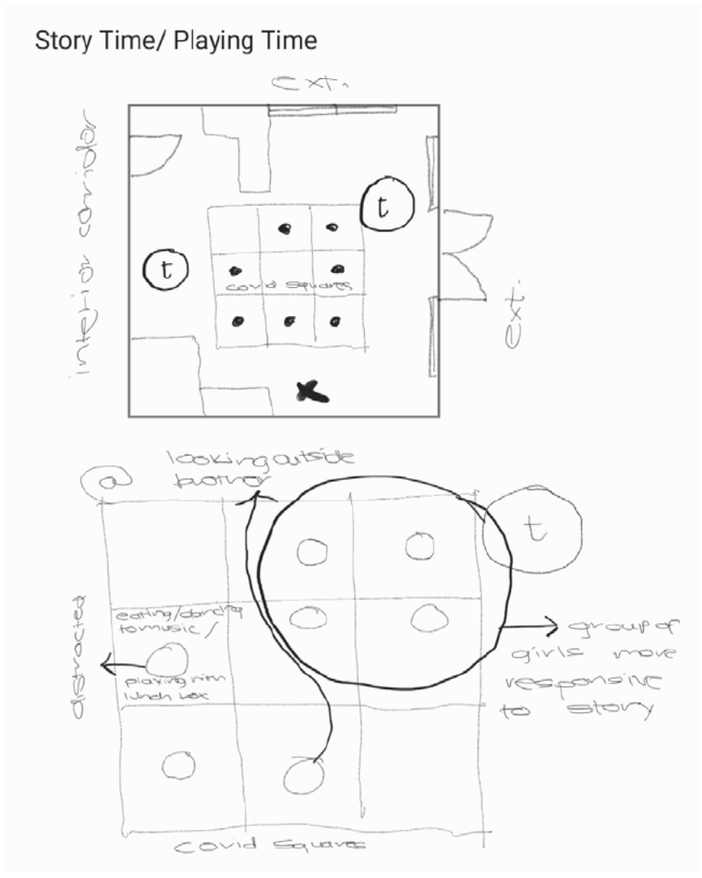


Table 6-57 Site H2 (Age 3-4) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	No change in material to designate activity spaces. All activities in the "covid squares".		Play/eat in the "covid squares". Story time. Sensory tray.	
Interior/ Exterior Relationship	Windows on two sides of the classroom – natural light and ventilation. Bright artificial light. Views of the playground and covered patio. Doors and windows open.		Teacher disappointed that children can't play outside on the rainy day. Children wash up outside. Use the outdoor patio during snack time.	
Movement	Restricted to the "covid square". Ease of access to the outside area promotes inside/outside room.		Subdued/constrained movements. Go outside to wash up.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – intimidating tall volume (counteracted by hanging lights). Full length windows appropriate for views for the children. Appropriate no. of children for the space, i.e., no crowding.		Talk to friends from inside the "covid square". Friends in adjacent squares. Most participate in the same conversation. Attentive/ responsive to the teacher.	
Potential/ Affordance	Tall volume affords climbing/ hanging elements. Views of the garden afford active learning opportunities.		Little imagination space. Similar to the other classroom, i.e., there is no room for difference or individuality (homogeneity).	
Noise	Closed door to prevent sound travel. 220 b/w wall between the classrooms.		Quiet/calm. Music & rain keep the children calm.	

Source of Tables and Figure: Author (2023)

Synthesis

The evaluation of the timed activity and mapping indicates passive and controlled activity. In contrast, the evidence of the space evaluation suggests the potential for active engagement. The limitations on activity can be ascribed to a teacher-centredness at the time of data collection, as well as the impact of the covid restrictions. A further factor causing more passive activity was the rainy weather, as noted in the environmental data.

The overall evaluation of the space is that it is one that is active, while the environment is controlled and active.

Age Group: 4 – 5
Observation Time (Outside): 10:16 – 10:34 Observation Time (Classroom): 11:28 – 11:46
13 children | 2 adults

Table 6-58 Site H2 (Age 4-5) Potential of Timed Activity

TIME	ACTIVITY	Evaluation
	OUTSIDE	
10:21	Snack time (outside) on the covered patio.	
10:32	Maintenance worker enters the space. Care giver sends a child into the class to get tissues.	
	CLASSROOM	
11:28	Play/read/draw/teacher time.	
11:30	Teacher leaves the room.	
11:33	Teacher returns to the room.	
11:38	Teacher says "1-2-3 eyes on me". Children pack away and clean up.	
11:41	Dance with the teacher.	
11:44	Musical statues: "Baby Shark". Care giver takes thermometer around the class to measure temperatures each time the music stops.	

Figure 6-24 Site H2 (Age 4-5) Activity Maps

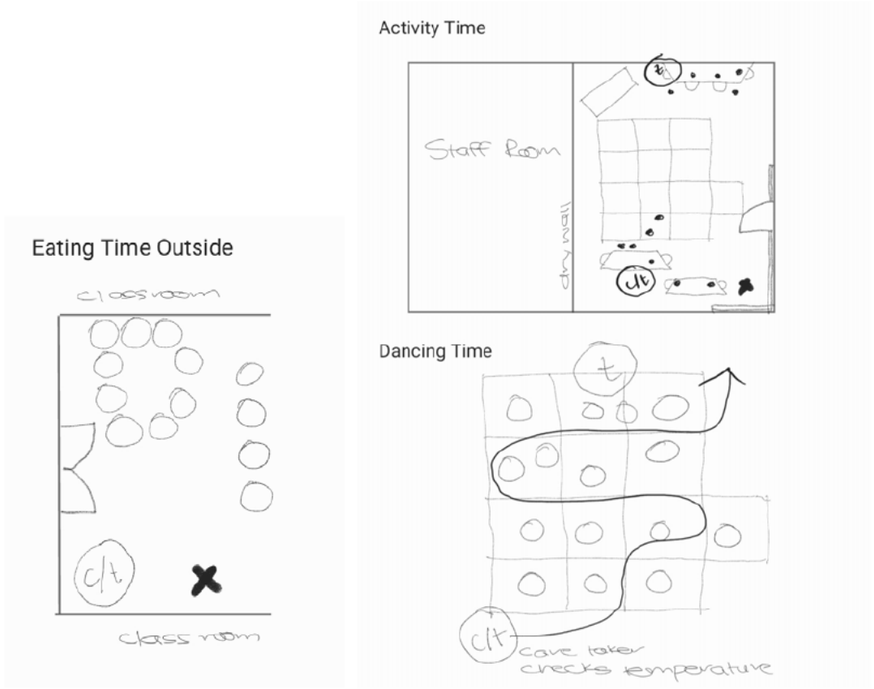


Table 6-59 Site H2 (Age 4-5) Potential of Space and Environment

	SPACE	Evaluation	ENVIRONMENT	Evaluation
Activities	No change in material to designate activity spaces. All activities in the "covid squares".		Snack time outside – not distanced. Draw at the tables. Dance on the carpet.	
Interior/ Exterior Relationship	Small clerestory windows. Doors open onto the interior corridor – almost no natural ventilation. Bright artificial light. No exterior views.		Use the outdoor covered patio during snack time. No connection to the other classrooms. **Feels claustrophobic**.	
Movement	Circular movement promoted – one point of access only.		Most stay in the play area. Music inspires dancing for some. Dance around the squares is not restricted.	
Interactions – Child/ Child and Child/ Teacher	Child/Space – intimidating tall volume (counteracted by hanging lights). Full length windows impeded by furniture, i.e., shelves. Somewhat appropriate no. of children for the space, i.e., some crowding & claustrophobia.		Very talkative during snack time. Not dependent on adult presence. Some children in groups. Some dispersed across the space. Attentive/responsive to the teacher.	
Potential/ Affordance	Tall volume affords climbing/ hanging elements.		Grass/ wooden fence/ doll house afford diverse play spaces outside. Children make the most of various activity spaces.	
Noise	Adjacent to the staff room – drywall separates the spaces.		Loud/ fun. High energy towards the end of the day.	

Source of Tables and Figure: Author (2023)

Synthesis

The evaluation of the timed activity and mapping shows active engagement and exploration. In contrast, the spatial qualities are not ideal. However, the environment created confirms the active nature of the class. Notably, the covid restrictions are not as evident in the learning environment.

The overall evaluation of the space is that it is passive and the overall evaluation of the environment is that it is active.

6.5.2 SUMMARY

The classroom observations which combined the recording of the timed activities, behavioural mapping, and an analysis of the potential of the classroom space and the environment provided a holistic picture of the quality of the learning environment that the children in these ECD centres experienced. The findings of each individual age group were recorded and evaluated in the preceding section, with Tables 6-18 to 6-59 showing the overall evaluations of all the classes at each site.

The evaluation of the timed activities across the age groups in Table 6-60 shows that younger children tend to be more active than older children. The only anomalies are the Gr groups and the 4-5-year-olds at the high socio-economic sites.

Table 6-60 Evaluation of Activity Levels

	E1	E2	E3	E4	E5	E6	H1	H2
Age 0 - 2			✓		✓		✓	✓
Age 1 - 3		✓						
Age 2 - 3				✓	✓		✓	✓
Age 3 - 4	✓				✓		✓	✓
Age 3 - 5			✓			✓		
Age 4 - 5		✓		✓			✓	✓
Age 4 - 6	✓							
Age 5 - 6				✓				
Overall evaluation								

Source: Author (2023

The findings from the evaluations of the spaces (Table 6-11) and environments (Table 6-12) indicate that the sites tend to have the same levels of active and passive exploration and engagement across the different physical spaces. The only anomaly is found at site H2, where a

class follows no particular pattern. When comparing the outcome with the nature of the physical environment, the evidence aligns with the differences in the architectural quality of the spaces.

Table 6-63 Evaluation of the Spaces

	E1	E2	E3	E4	E5	E6	H1	H2
Age 0 - 2			✓		✓		✓	✓
Age 1 - 3		✓						
Age 2 - 3				✓	✓		✓	✓
Age 3 - 4	✓				✓		✓	✓
Age 3 - 5			✓			✓		
Age 4 - 5		✓		✓			✓	✓
Age 4 - 6	✓							
Age 5 - 6				✓				
Overall evaluation								

Source of Tables: Author (2023)

Table 6-62 Evaluation of the Environments

	E1	E2	E3	E4	E5	E6	H1	H2
Age 0 - 2			✓		✓		✓	✓
Age 1 - 3		✓						
Age 2 - 3				✓	✓		✓	✓
Age 3 - 4	✓				✓		✓	✓
Age 3 - 5			✓			✓		
Age 4 - 5		✓		✓			✓	✓
Age 4 - 6	✓							
Age 5 - 6				✓				
Overall Evaluation								

The limitations towards affording exploration and engagement included a teacher-centred pedagogy, spatial constraints, and the impact of the COVID-19 restrictions in 2020 when data collection occurred. Thus, returning to the phenomenological lens, the limitations in developing the environment as a third teacher and a third space impact the potential for creating a place.

The engagement with the adult participants follows in the next section, thus furthering the understanding of the quality at the research sites.

6.6 INTERVIEWS – PRINCIPALS AND TEACHERS

The inclusion of interviews was originally conceived as part of the research design to explore the lived experience of the ECD learning environment. The focus was mostly to understand the principals' and teachers' views of the qualities of their spaces and how they used the spaces on a daily basis. As discussed in Chapter Four, Section 4.2, the engagement with the principals of the ECD centres included discussions on how the physical infrastructure of the sites was developed. The development stories that emerged, which often included frustrations and hardships, together with the literature relating to the South African ECD context, shifted my thinking about the role of the interviews and the research towards a more rights-based approach and positioning in the transformative research paradigm, as discussed in Section 2.4. Working according to the aims and objectives of the study, the interviews contribute to the exploration of research question five: How do the selected ECD centres' occupants (children and adults) experience their learning environments? Although the original intent included child participation, that aspect was removed due to the longer period of engagement required, the challenges of the COVID-19 restrictions, and the ethical limitations of working with children. A component of child participation is reported on as a pilot study in Chapter One, Section 1.3.5.

The theoretical framing of the interview findings are considered in relation to the concepts of the third space and the third teacher towards the co-construction of knowledge. The notions of co-construction and lived experience align with the pattern language methodology, where patterns of daily activities inform how a design problem can be resolved. However, through the thematical analysis, the most appropriate framing of the data was found to be through the ecological

systems (Bronfenbrenner, 1979) model, where the influence of different scales (systems) is considered to impact child development.

6.6.1 INTERVIEW – CODING

I used the inductive thematic analysis process of listening to the voice recordings of the interviews, reading the transcriptions of the interviews, and reading the notes made during the interviews to develop codes from the data. The coding thus represents aspects that the interviewees included in their discussions (Braun and Clarke, 2012). Some of the codes relate directly to the physical environment and aspects that I asked about, while others emerged from the personal reflections or views that the participants shared during their interviews. The codes listed in Table 6-63 highlight the broad and site-specific experiences and challenges for ECD delivery and the ECD learning environments in their contexts. Furthering the inductive thematic analysis process, each code was then described to formulate the questions that the participants explored (Braun and Clarke, 2012). Analytical maps were drawn to understand the data and consider the relationships between the codes.

Table 6-63 Inductive Thematic Analysis - Codes with Descriptions

Codes	Descriptions
Belonging	Do children and staff feel secure and do they have a sense of ownership of the centre?
Challenges to ECD in the area	What aspects are posing challenges to ECD provision in the area?
Children's voices	Do the children have an opportunity to express what they want their environment to be like?
Classes and numbers	What is the number of children per class and what ages are accommodated in each class?
Community relationship	What type of relationship does the centre have with the surrounding community?
COVID-19 challenges	How did the changes that the covid restrictions imposed impact the care and development of the children?

Codes	Descriptions
Department registration	What is the status of the centre's registration with the Department of Social Development?
Training and experience in ECD	What training and experience do the teacher and principal have to work in early childhood development?
Funding for buildings and equipment	Who provided the funding for the property, construction, maintenance, and upgrades of the buildings? Who provides the equipment and learning materials?
Inclusive	How does the centre make provision for children with disabilities or learning difficulties?
Origin of the ECD centre	How and by whom was the centre founded and developed?
Outdoor environment	What is the role of the outdoor environment?
Pedagogy	What pedagogic approach is followed in the centre?
Quality of the buildings	What are the positives and negatives about the classrooms and the school?
Voice - ECD women	How are the women able to express their views and concerns?

Source: Author (2022)

Fig. 6-25 illustrates the process of creating an analytical map to find the relationships between the codes. The map formed the basis for establishing the themes in the data. Notably, the codes did not provide a simple grouping, but rather a complex web of relatedness. Considering this complexity, I returned to the literature and theoretical framing of the research. This led to the inclusion of the ecological systems theory as the lens through which to establish the themes in the data.

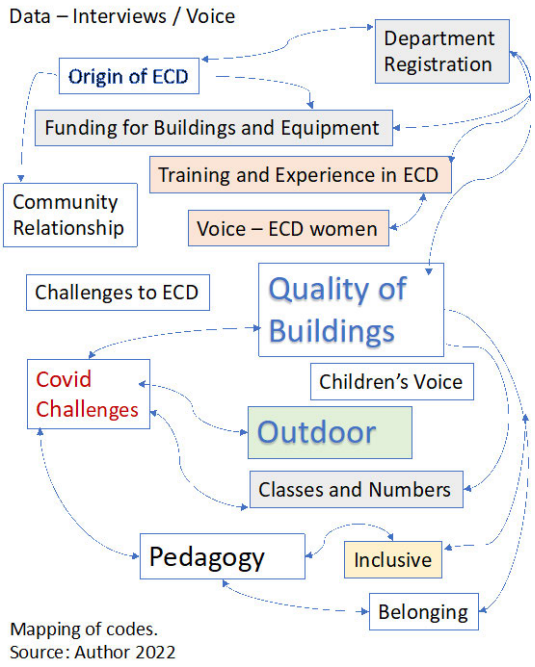


Figure 6-25 Analytical Map of the Codes in the Data

Source: Author (2022)

6.6.2 INTERVIEW – THEMES

The theoretical lens of the ecological systems theory was applied to the analysis of the codes to produce themes. The themes established were the ECD macro context, the ECD meso context, the ECD space, and the ECD place. The chronosystem was included, considering the overarching societal change related to the COVID-19 pandemic, which impacted the study. There were thus five themes in total. Table 6-64 provides a breakdown of each theme with the codes and extracts from the interview transcripts to illustrate the analysis process.

Table 6-64 Thematic Analysis with Codes and Extracts from the Transcripts

Themes	Codes	Extracts from the Transcripts
ECD macro context	Challenges to ECD in the area	*"… If it was winter, because it was cold. Some of the parents, they insist, do not go outside, my child will get sick!"* T8.
	Department registration	*"We got in 2017 is a conditional grant…. They said there's no money. There's no money. Government don't have money for the ECD, but there's people fighting for us now, we hope"* P5.
	Training and experience in ECD	"*It's very hard. We are looking for the qualified teachers… and it's great to have experienced teachers"* P4.
ECD meso context	Voice - ECD women	*"Today, we suffer so many things, difficulties, rejection, this and this, this matter, whatever, gender violence, gender-based, all these things come from the early stage. But it worries me if our government don't see that we need to focus on the ECD"* P3.
	Origin of the ECD centre	*"It was 2002 and I fell pregnant. I was a teenager. So, my pastor's wife, my mum, I call her my mum, but she's my pastor's wife. She decided to open this crèche because she want me to go back to school because in my home there was no one who'll look after my baby. And she decided to open this crèche, it was 2002 October…. So the following year, I will go to school. So, 2003 I went back to school and they started the crèche from there. I finished matric at 2006, I think, and then I come back and work here since then"* P4.
	Community relationship	*"… We're working hand-in-hand with the parents…. So the parents might call and say, 'you know what, today I'm going to be a bit late, around four o'clock, so we're like, okay, no, its fine..."* T4.
	Funding for buildings and equipment	"*They came, they said we want to know what is your needs. We see that you are trying your best. They said write down – I wrote down everything, everything……. She did even extra job because to put the ceiling there, it was the extra job… …. Even to put the toilet in the shower, it was the extra job. Even to put, to cut the window to make the door, it was the extra job"* P5.
Microsystem ECD space	Classes and numbers	"*I mean, when I started our classrooms in the old school had 12 children, but our space was literally this size, this size of this office. So, our space was very, very limited. Now we've got 20 children, and large classrooms. I do miss at times just getting that one-on-one with the children when*

		there's fewer in the class. But I have an intern and I have an assistant, so there's 3 of us, so with 20 that's good" T2.
	Quality of the buildings *	*"We were just having a meeting that we need to just make our school look better now. We need to paint it, even inside, the paint is torn, it's coming off. Even outside. Even the areas outside need to be, and we add some playing areas, some tyres to step on or paint. We like to do this"* P3.
	Outdoor area	*"Yeah, but If you are not taking them outside, they ask you why you are not taking outdoors. They need to"* P4.
Microsystem ECD place	Pedagogy	*"People think as pre-primary as running around like wild little things. It's very structured, very intentional, and we work around themes so that's also nice. So, our stories are related to themes. Our concepts are related to themes"* P2.
	Children's voices	*"Ooh! They were so happy! They were so happy, and they were so excited! Because they have small toilets, for like…"* T7.
	Inclusive education	*"Yeah, whenever I'm doing lesson plan, I have to also plan for them because they need special attention. We need activities that will accommodate them. We've had a remedial group"* T6.
Chrono System	COVID-19 challenges	*"Yes, we have different areas. And then during the COVID was must pack up all…. And then we do to, need a space"* T8. *"Lot of our equipment it's not used, it's there. Especially all the…, our fantasy areas, then music. Yeah, most of our equipment is stood out because of the COVID"* P3.

Source: Author (2022)

* Quality of the buildings: The scope of this code ranges from specific building parameters, such as layout or size, to also considering environmental qualities, such as colour and light. The list of sub-codes included is provided in Table 6-65, with examples of interviewee quotations to illustrate the nature of the evidence.

Table 6-65 Microsystem ECD Space Sub-Theme: Quality of the Buildings

Quality of the Buildings Sub-Codes	**Interview Extracts**
Thermal Comfort	*"It feels very hot…. If winter, eish, it was very, very cold!"* T8.
Light	*"I think lighting is import…, and natural light..."* T2.
Sound	*"Yeah, so because, like sometimes when we are teaching, in the other side, they are teaching too…. And so, it's too much noise over there. So, on this side, I have to put my voice up. So, that they can hear me"* T5.
Floor finish	*"And does that work? The carpet? And when the children mess?"* researcher *"It's smelly. And we have to accommodate those children who are allergic to carpet and all that, yeah"* T6.
Colour	*"Because it's a class. I think it's a, because it is under the place they are there most time. I think it's better that way.* (neutral) *When, because if there's a lot of colours, then their concentration will…, it will actually be disturbing them"* T3.
Open plan versus separate rooms	*"It was very hard to work there. You cannot squatter, like, them together at different ages because the big kids would sometimes bully the small ones"* T7.
Individual versus shared	*"A quiet space, no. No, but I have a book here and there. So, they have to read it on their own. So, like a picture reading. Yeah, that's all I have. But they do read the stories, but it's not very quiet"* T5.
Ablutions	*"Because I have to leave other children to go outside for a child who's going to the toilet and leave those behind. I just wish that the toilet was inside. Maybe it would be more… easier for the teacher"* T6.
Relation between inside and outside areas	*"I need their focus and concentration only on the morning ring because I have to do eye contact with them. So, we sit and like… they sit on the other side. Then they don't see outside"* T7.
Spatial qualities	*"Usually, you'd have some display out. So, you use the space to kind of to get the children thinking about it. That space is not ideal, the, because it is great if you go to any preschool, it's normally at the entrance for here, and I do think it should be in like the heart of a school"* T2.

Source: Author (2022)

The qualitative approach and transformative research lens are used to present the findings in a manner that will continue the notion of giving a voice to the participants (Mertens, 2007). My analysis relies heavily on the words extracted from the interview transcripts. I took care to bring

forward the individual differences as well as the points of agreement across the dataset to provide a transparent reflection of the co-construction of the research. The following section unpacks the findings from each theme, with a synthesis to connect the themes within the ecological model.

6.6.3 THEME ONE – ECD MACRO CONTEXT

This theme of the macro context emerged from the participants' responses when describing the influences on the ECD learning environment, according to Bronfenbrenner's ecological systems theory. Macro systems, which represent societal systems such as culture, socio-economic contexts, and politics, are often influences that indirectly impact the quality of the ECD in a given context. Three codes were identified: challenges to ECD in the area, departments registration, and training and experience in ECD. Each of these codes represents different but interconnected systems, where changes in one system can influence the impact of another. The role of government strategies and policies is directly related to these findings.

Challenges to the ECD in the area: This code developed by noticing that there are challenges to the provision of quality ECD. These were highlighted in the interviews with teachers and principals at the case study sites. These challenges tend to occur at the macrosystemic level, as this level tends to represent broad ideological, social, cultural, and political concerns.

The majority of the interviewees with a low socio-economic background come from childhoods with no formalised early learning development. As explained by one principal (P3): *"Actually, where I was born, there was no ECD centres…. Then in 1990, it's where they introduced the ECD teaching"*. She further recognises the challenges faced by children today, and how ECD can assist in changing our society: "*Today, we suffer so many things, difficulties, rejection, this and this, this matter, whatever, gender violence, gender-based, all these things come from the early stage*".

The participants further acknowledged that many ECD centres provide childcare rather than quality ECD. One teacher reflected on her previous experiences:

- T3: *"They weren't doing anything…. Where it was singing and they sleep, eat, you know? They didn't do much".*
- T4: *"Some, I could say some crèches that I went to were not as, how can I put it, they were informal crèches. And it's quite different when you come this side and find different crèches and how they operate this side being compared to the others that are still starting up and have no clue what to do".*

The phenomenon of childcare has been identified as stemming from the growing pressure on mothers to work long hours, as reflected by a principal (P2): "… *So, you do get those people who literally work early till late…. Childcare is the biggest thing, and meals".* Similarly, a teacher (T4) expressed concern regarding the early arrival of some children, as early as 6 a.m. A related issue is the means of transport for children in lower socio-economic areas from home to school. A number of the case study sites are not located close to taxi stops, and one principal in particular expressed her concern about the very steep road that children must walk up and down between the taxi stop and the school. **"***Yes, even the small ones, like 18 months. They walk from the top"* (P4).

The position of parents as authoritarians over their children, even when in the care of the school, is noted to contrast with expert views on child development. An example of this is children not being allowed to play outside during colder weather: "*If it was winter, because it was cold. Some of the parents, they insist, do not go outside, my child will get sick!"* (T8). Another teacher (T1) elaborated further by explaining the shift from before*: "But times are also changing. In this sense, it's the parents that dictate more. When we allow them to run and play in the puddles, like yesterday, the parents would complain".* These parental views are often based on cultural norms rather than knowledge and understanding of appropriate early childhood development, and this undermines the potential of the learning environment.

Principals and teachers all expressed concern about the high number of children per group and the many more requiring places in ECD centres. They ascribe this to a focus on quantity rather than quality and criticise group sizes where there is one teacher for thirty-five children. An issue

of overcrowding and mixing of age groups was similarly raised with concern*: "Two classes and the children were mixed together, all ages".* P4 commented on the need for her school to accommodate more children: *"I like the school, but it's look like the school is going to be small. Yes, I'm having more kids coming from that other area. Because on the waiting list, I can see the parents are coming".* She says that the growth in applications is because her ECD centre is recognised in the community as providing high-quality early childhood development.

Some participants acknowledge that not everyone understands the value of early childhood development, as shown by destructive actions such as vandalism and theft and the prioritisation of economic development over early education:

- *"There comes jealousy, I don't know to who or two isigebengu or to who I don't know but they vandalised this place"* (P5).
- *"They gave children tablets. Thirty tablets. The robbers break the window and stole… I'm just sleeping here myself, because we don't have enough money to pay the security"* (P5).
- *"The school was demolished, and the shopping centre was built on its space"* (P1).

Department Registration

The interviews with the principals of the various ECD centres included the question: What is the status of the centre's registration with the Department of Social Development? The registration status helps position the site among the range of ECD centre categories. The knowledge that emerged from this discussion showed a sense of frustration with the systemic issues already found in the literature. It is important to note that the criteria for registration with the department include good infrastructure, so the centres rely heavily on the condition of their infrastructure for their registration.

A primary concern raised was that it takes many years before the ECD centres obtain their registration. The delays are attributed to the centres not meeting the requirements for registration and to the carelessness of the staff at the department.

- P3: *"When we started up there, it was impossible to register because we didn't have everything. So, till 2015 when we're here so, '11, '12' 13', we applied but it was rejected. Because they come and check and we need to have this and this and this and this to comply with the regulations".*
- P4: *"Them being careless because the lady, she helped my mother later. She said, oh I've been seeing your crèche file every time, it's putting underneath the table…".*

The principals seemed to be unclear about why they had only received conditional registration:

- P6: *"Only then we get some, but we are still in the conditional grant. It's not full time. We sign three years because all the funds, we registered but we didn't get anything. We registered in 2015 till 2017".*
- P5: *"… We got in 2017 is a conditional grant… They said there's no money. There's no money. Government don't have money for the ECD, but there's people fighting for us now, we hope."*

The limitation on how much funding a centre received was questioned, as it was not always in line with the number of children at the centre. The participants also compared their grant to that of other centres in the area.

- P4: "*And then they just took only 25 kids. And then I was telling the social worker, she said, say I can't do anything. I said, I've got like almost 60…. But I was telling my mum that it's so pities because some of other crèches are getting lot of money from DSD".*

A primary concern was raised about the amount of the grant and how it needs to be used.

- P5: "They *gave us the list, what by that money they would put in our account, what we supposed to do. They said, you need to take R4000 for the payment of the staff because they said they didn't pay the staff. The staff must be paid by the children. You see? Yeah, it's too small and R4000 divided by 11 staff I have. It's nothing".*

The limitations of the grant force the ECD centres to rely on fees from the parents, who often cannot afford to pay for their children's early childhood development.

- P6: "*No, in 2015 we just received the certificate from Social Development and the Health Environmental. We received this certificate in 2015, and then in 2017 we started to get grant. They did give us for salary, but not enough. We have to add with school fees".*

Training and Experience in Early Childhood Development

The question asked was: What training and experience do the teacher and principal have to work in early childhood development? Although the training and experience of the participants were included to provide background, the responses emerged as relevant to their understanding of what quality ECD learning environments are. As one teacher busy with her training explained:

MC: "… *Now that you're studying?"*
T3: *"Yes".*
MC: *"Are you understanding?"*
T3: *"Yes, I'm understanding it much better. Yes, it's clicking".*

Some of the principals also noted that training makes a difference in the quality of their ECD centre: "*It's very hard. We are looking for the qualified teachers" … "And it's great to have experienced teachers"* (P3).

All the participants agreed on the value of education and training to improve their ability to work with children. "*What I like about the crèche…, most of the time, there are trainings. Each year they come. Some people will come, and they would ask if we do have level four"* (T7). *"And I just realised I loved working with children so much, so we did the different ECD courses. And I realised I had a lot to offer children because I just loved what I was doing"* (P3).

It is thus relevant to note that many of the women working in ECD centres gain work experience while obtaining their qualifications: "*I got started at the kitchen, then I would go to the babies, then after I teach these children… Yes, I've done courses … for the child, babies… I'm not finished now"* (T8). The focus of training is short courses or part-time diploma courses completed over time: *"I made education, health, Educare didactics. All of these are N4's and then N5, it's Educare, psychology. Yes, it's a diploma in Educare"* (T3).

It was also noted that the government funding for teacher training is limited, and the centres are reliant on NGO sponsorships: *"The grant, 5% for training, we are not using it because the NGO helps us…"* (P6).

The definition and understanding of what quality ECD are dependent on their level of education and experience. It was noticeable that the participants who had higher qualifications and experience were in a better position to discuss the relationship between children and the learning environment.

6.6.3 THEME TWO – ECD MESO CONTEXT

This theme arose from the participants' responses describing the influences on the ECD learning environment that belong to the Meso context as identified by Bronfenbrenner's ecological systems theory.

Voice - ECD women

In keeping with the research paradigm of interpretivism and transformation, it was important to get a sense of the participants' ability to express their views and concerns openly.

The participants spoke with passion about their role and expressed a love for children: T4: "*Well, to be quite honest, it was because I loved working with children, so I did my ECD",* and T5: *"Yeah, and I love them, working with children because they just bring joy".* There is also a sense of understanding of the important role that teachers play in the lives of children, as expressed by T1: "*Because you're so involved in that child's life, they are, they're your children".*

Some teachers expressed a sense of pride and ownership towards their learning spaces and understood the value of a good environment for the children. Other teachers expressed their appreciation for improvements or new classrooms that were built; they understood the difference it made for them and the children.

The principals and teachers in the lower socio-economic context all expressed their appreciation for the work of the NGOs. There was a sense that they would not be in a position to run the ECD

centre and continue their work without this continued support. T7 says, "*the NGO, they have helped us so much. Because they just sponsor us".* The principal of site E5 spoke with a deep sense of gratitude towards the various organisations and individuals that helped build and improve the quality of their buildings over the years. She remembered everyone by name, shared photographs of the building workshop, and praised the individuals for their contributions. She felt that she was heard. P5: "*They said write down – I wrote down everything, everything. They did everything that I was asking, and they on top of that, they, the guy who was the contractor of that time, said that contractor, she did even extra job because to put the ceiling there, it was the extra job".*

The teacher of site E6, which has recently been constructed using repurposed shipping containers, explained her initial reservations about the proposal for the buildings, but then her utter delight with the finished buildings. T7: *"I also, we also like this because by the time they say that we're going to build you some new school with the container, and I was like, container?... I was waiting to see, waiting to see from the day they said they would come. I was like, I want to see this container. But when the containers were here, I was like, oh wow! it's so nice! Thank you for coming, do some drawings, do some nice drawings outside".*

There was a slight difference in terms of the control of decisions about the learning environment between the high and low socio-economic areas. The teachers from sites H1 and H2 seemed to be given more freedom in how they set up their classes in terms of layout and decoration, while the decisions at sites E1 to E6 seemed to be made by the principals. However, at site E1, the principal mentioned that 'they', referring to all the staff, had a meeting to discuss their school environment and how they could improve it.

Origin of the ECD Centre

During the interviews with the principals of each ECD centre, I asked the question, 'How and by whom was the centre founded and developed?' Their responses provided me with a deep understanding of the challenges that they faced in running the centres and their passion for what they did. Most of the centres developed over time with the support of families, churches, NGOs,

and other stakeholders who worked together to improve access to quality early childhood development for the children in their communities.

Site E1, as explained by P1, the founder of the ECD centre, *"was started the church… and they gave us the room attached to the church. It was around 2004 to 2010. Then from 2011, August, we enter here because here it was just a house. Then we got sponsors who just demolished that house and built this for us".*

Site E2 was also founded by a church, and it originally used the church hall as a preschool during the week. P6 elaborates on what initiated the development of the ECD centre: "*It was 2002; I was doing matric, and I fell pregnant. I was a teenager. So, my pastor's wife, my mum, I call her my mum, but she's my pastor's wife. She decided to open this crèche because she wants me to go back to school because in my home there was no one who'll look after my baby. And she decided to open this crèche".*

A number of the ECD centres from the low socio-economic area are family-run, where the centres were started by mothers and their daughters are now running the centres and teaching there as well. The principal (P4) of site E4 elaborated on her role in continuing the legacy that her mother started: "*The reason I'm doing ECD because this was, my mum was the founder of the crèche. so, mum she's old and we sit down together with the family. they said because my mum she's old, I need to just take over and run the business. So, I started here, so I think I've got four years now. Because my mum, she started the crèche, it was 1994 and she started at the one of the churches, and then after that they were at the garage, and then after that they moved down here. So, I took time. It was five years ago, if I'm not mistaken. That's why I have to be a part of the ECD. Because of my mum".*

The story of site E5 is similar, with a very passionate principal (P5) working to continue the good work in the centre that her mother built up over the years. "*This centre was started by my mum, who was a community headworker in 90s…. The parents' house, when if she goes around, she found children playing with mud and soil".* She also explains in detail how the community was involved in the original construction of the school building: "*The crèche was started in that*

rondavel of the family of a community member. You can use that land, but let's go to Nkosi Chief and tell him that I'm just offering you a land to build a community crèche, because you are going to help us…. So that first building was built by the community".

In parallel, site H2, situated in a high socio-economic area, originated within a church, as discussed by P2: *"And at that time, we had the very exciting addition of building this section for the kids' mums to eat and the… one of the elders at the time, just had this thought about using it. It's a waste to leave it open every day, so let's use it. Why not use it as a preschool? And so, 2008, we set it up as a preschool…. And it was quite amazing, because then it literally went from seven till up, to about maybe eighteen to about forty-five to seventy-something…to over a hundred".* The ECD centre is seen as an extension of the church's ministry, as many of the children come from families that do not attend the church. The current principal has been in her role since the preschool opened. She shared her passion for making a difference in children's lives while they were young.

Site H1 is owned by the same individual who is the founding director of the NGO that supports sites E1 to E6. Their vision is to make a difference in the lives of children by supporting the early childhood development centres and by providing scholarships for children to attend site H1 as well as the primary and secondary schools on the same campus.

Community Relationship

During the interviews, it became evident that most of the ECD centres are embedded in their communities. There is a relationship between the ECD centre and the community as they work to support each other by meeting each other's needs. Most of the ECD centres are also physically located to form part of a community. They are either adjacent to the principal's home or to a church. This strengthens the ownership of the ECD centres as they are rooted in their communities.

P3 expressed that the ECD centre was asked by the community to include Grade R and the foundation phase: *"The community cried that they need the education here because it was a good education".*

The relationship with the parents is critical to how the ECD functions, as explained by T4: *"… We're working hand-in-hand with the parents…. So, the parents might call and say, you know what, today I'm going to be a bit late, around four o'clock, so we're like, okay, no, its fine".*

P5 explains that the need for early childhood development was recognised in the community: *"She was working as a visiting the parents' houses, when if she go around, she found children playing with mud and soil…. She was going to do the crèche here, because she is want to develop the community you see".* The community played a critical role in developing the ECD centre: "… G*et people in the community who is going to build the crèche by their own hands, but ask the villagers, we are going to give you the materials…. You are employing the people, changing week-by-week other people".*

Site E5 includes health services, as it is evident that there is a need for this service in the community. The ECD centre and clinic share the same property. P5 shared, *"… building the first aid, because what my mum was having on her mind was that there was no clinic here. People, when they need to go to hospitals, they go just take taxis to Botha's Hill, to Pinetown, wherever".* This centre also supports the community by providing some basic services: *"Even people who, and you'll see just now, the ladies came to because their post office is closed. They came to do the photocopy".*

The newly constructed ECD centre at site E6 was very well received by their surrounding community: *"And the community? Because there's a lot of people that live here. Do they like this building? Yebo*! (Yes, they like it!)*"* (T7).

The interviews also indicated that there have recently been challenges to the sense of ownership of the ECD centre by the community:

- P5: *"… Not protected, because why they came and…. But you know the community, the adults can protect the building, but the problem, there is this thing of drugs. Whoonga, drugs. We can't control those".*
- P4: *"No, I don't want anyone to use this. It's not safe, especially in the covid now".*

The community relationships in the high socio-economic areas are more formalised by being part of a church (site E2) and being part of a school campus (site E1).

- T1: "*And we've got this beautiful campus too. It's all closed in, and we've taken out kids.*"
- P2: *"We'd rather work alongside people and support them, rather than add more stress to them, so we've just been in that situation to help people like that".*
- MC: *"Is it mostly people from the church, or is it kind of broader than that?"* P2: *"Ja, pretty much majority not from the church".*

Funding for Buildings and Equipment

The way that the ECD centres are funded directly impacts the characteristics of the physical environment and the quality of the learning environment. In accordance with the policy framework for early childhood development, it is a predominant trend for the ECD centres in the low socio-economic areas to rely heavily on NGOs and other support mechanisms to obtain funds to construct or improve the buildings and equipment. This was also evident in the interviews, where sites E1 to E6 all received funding in some form.

- P3: *"… These buildings were built…. And there was there a private company that sponsored…. … Donated that from the church. Nation Changes, they donated this container… and while we were building, we had another team from overseas...".*
- MC: *"The house belonged to your dad, your father?"*
  P6: *"Yes, my pastor, actually*". Talking about the large hall space in the church, "*Yes, it was a church, then Sunday, on Monday they …. Even now we under the church from Joburg, so the church helped us.... Yes, a lot, a lot to renovate all this building, because it was not like this".*
- P4: "*The land is my dad's land… Yes, It was coming from a donor…. The partitions, oh the partitions, I asked the NGO, and they give it to me".*
- P5 reflected on various interventions over the years, starting with the first building: "*… We don't have money to pay the people who is going to do the work because we gave you the stamps for the community… That stamps they, just the people took the stamp and go*

to the shop and buy the food". And a later addition: *"Then I started to go around asking for donations…. That guy came with his construction. They build this, because that man said, I am going to build two classes for you…".* The company also made some additional repairs and improved the buildings' finishes after recognising the need for further assistance: "*They came, they said we want to know what is your needs? We see that you are trying your best. They said write down – I wrote down everything, everything…. She did even extra job, because to put the ceiling there, it was the extra job…. Even to put the toilet in the shower, it was the extra job. Even to put, to cut the window to make the door, it was the extra job".*

The ECD centre principals showed resilience in terms of sourcing funding on their own, as and when it was needed. The data also indicated that the involvement of NGOs in the sector has increased over time, with most of the centres benefiting from a well-established relationship with at least two NGOs. It was thus very noticeable that on site E3, where there was a very limited relationship with an NGO, the quality of the learning environment suffered.

6.6.4 THEME THREE – ECD MICROSYSTEM: SPACE

This theme arose from the participants' responses describing the influences on the ECD learning environment that are related to the tangible environment. A number of the codes assigned to the data were related to the physical environment. The code 'quality of the buildings' was further analysed to include a range of sub-codes. Each is discussed in the section below.

Classes and Numbers

A key component of an ECD learning environment is the number of children accommodated in a learning space. This relationship is often also determined by the layout of the school, the sizes of the classrooms, and how the age groups are divided. The majority of the ECD research sites had separate classes for each age group. The sizes of the rooms varied, from rather small to very large, as was noted in the architectural survey. Three of the sites had a large open plan hall space with low-level divisions to form separate group spaces.

The responses from the teachers and the principals relating to the classes and numbers of children acknowledged that smaller numbers of children are more suitable for a smaller space. However, coupled with the size of the space, the number of adults (adult-child ratio) was also recognised to be critical to quality:

- P6: *"Yes, they were all down there. When I go down, I saw that …. They were more than 50. Then I decided… to take five years up there and leave four years down there".*
- T1: *"Because it's that one-on-one. You can put 30, because we've got enough space, but am I going to get to know each child as personally? So, it's more about the connection and the fact that if the number keeps growing, even if there's more adults, you're still responsible for all of the kids".*
- T2: *"So it's not necessarily the adult-to-child ratio, its more of the space…. No, it definitely is the child-to-adult ratio, but for me personally, I think 16 is the max. in my class".*

It was noticeable that the teachers in the high socio-economic area value a lower number of children in their class, even when they have the space for more children: "*I mean, when I started, our classrooms in the old school had 12 children, but our space was literally this size, this size of this office. So, our space was very, very limited. Now we've got 20 children, and large classrooms. I do miss at times just getting that one-on-one with the children when there's fewer in the class. But I have an intern, and I have an assistant, so there's 3 of us, so with 20, that's a good…"* (T2).

In contrast, it seemed that some teachers from the low socio-economic area seemed to simply accept the high numbers of children in the classes as the norm. MC: *"When you had so many children, did you have more help? Was there another teacher, or was it just you?"* T8: *"It's me.* MC: *"It's just you. Thirty-five children?"* T8: *"Yes".* This high number was specifically concerning as site E3, where T8 is a teacher, has an open plan room where three groups are combined.

The sites with one open-plan space shared by several groups found ways to create a learning environment for each group, as they had no other option:

- T4: *"Yes, we manoeuvre a way to make it work because, for example, I think it's the two to three's, they are the ones that first eat before the other older kids. So, when they have snack time, they eat first, while we are teaching the others, so it's different schedules".*

There was also an acknowledgement that the space was sometimes just too small for the number of children, specifically when age groups were combined:

- T7: *"… Or all group ages, they were just squattered together.* MC: "*Just one space?*". T7: *"All the babies, the toddlers, the big ones, they were squattered together".*
- T8: "*It's too small. Changing in the toilets. And then I want to change another, I need another class.* MC: *It's difficult because your class is with the babies?"* T8: *Yes! Yes! Yes! If we can change…".*

The responses by some principals also indicated that they follow the guidance from the Department of Social Development, which governs the ECD centres. P5: "*Because when the social worker came here, they asked if we have more children because they, they give us the number to have in each class. But if the number is more than the number we have, they said we can use this place to be the extra class that can be used by that side".*

Most of the principals were aware of the regulations in terms of the number of toilets per child and how that was used to determine the total number of children that their centre could accommodate.

Quality of the Buildings

Establishing the participants' views on the quality of their learning environment was at the heart of this research. The majority of the participants from the low socio-economic area had to be prompted with questions about specific aspects of their spaces. In contrast, the participants from the high socio-economic area spoke at length, highlighting various aspects that they found positive or negative. The section below is divided under headings drawn from the range of aspects covered when discussing the quality of the learning environments.

Thermal Comfort

Several of the participants from the low socio-economic area reported that the buildings did not provide thermal comfort. It was noticeable that on the warm days in November, when temperatures were in the high 20s or even 30^{o} Celsius outside, the learning spaces were also very warm and uncomfortable:

- P6: "*Yeah, when it's cold, it's cold, and when it's hot, it's hot".*
- T8: "*It feels very hot…. If winter, eish! It was very, very cold".*

The participants acknowledged that the lack of thermal comfort impacted negatively on the children, as expressed by T4: *"Seriously, it was too hot, and the youngsters just say, 'Miss, we are too tired; we can't even do anything now'".*

Some participants spoke of ways of dealing with the issues and referred to using a fan, opening windows, installing a ceiling, or switching the electrical lights off as ways to deal with the heat during the summer months, while one principal suggested that they needed air conditioning:

- MC: "*Before they did the ceilings, were the classes warmer?"* T6: *"It was very warmer, and it's making the children fail to concentrate whenever it's hot.... I think we need air conditioner".*
- P1: "*It just seems to be a lot cooler with the lights off".*
- T4: *"Yes, the main thing that we do is just open all the doors. And then all the windows".*

The responses showed that the cold was more difficult to deal with, as expressed by T5: "*It's cold, even though we close the windows and everything, yeah".*

A suspended ceiling was installed at site E5, which made a slight difference to the temperature, but the buildings were still very hot and uncomfortable inside. Noticing the heat, I enquired if the principal knew whether any insulation had been placed in the cavity: "*It's called insulation. It's like a foam, or like polystyrene. Anything like that? Nothing?"* P5: *"Nothing".*

At the high socio-economic sites, air conditioning was installed in some of the rooms that did not have good orientation and lacked cross-ventilation. However, the teacher indicated that the installation was still not ideal. T2: "*I like air flow, and so air flow has been our biggest issue here in the heat. The aircon is not over our space…. There's aircons in all these classrooms along the side".* Cross-ventilation was also recognised as an issue at site H1, where the windows were not openable.

Light

During the visits to the research sites, we noted that the lights were generally switched on in the centres. Only Site E4 seemed to have enough daylight to function well without lighting. It was also reported that two of the buildings were without electricity. One at site E2 was due to a fault that needed repair, and the timber classroom at site E4 had no electrical installation. T5: "*But there's no electricity, so you find it a bit dark on a rainy day".* This response and the one below indicate that the lights are specifically needed on overcast days. MC: "*Do you have to switch on the electric light or not?"* T3: *"It depends on the…, as I've said, because of the weather".*

The teachers also indicated that the requirement for light depended on the age group of the children and what activity was taking place in the space. P1: "*I think, generally speaking, they usually have their lights on just for the lighting when they're working".* And T1: "*If you turn the lights off…".* There was also a preference for natural light, as expressed by T2: "*I think lighting is important, and natural light...".*

Sound

The responses from participants from the sites with open-plan shared learning spaces indicated that the noise level can be a problem when all the children are busy in these spaces:

- MC: *"Does it get very noisy in there?"* P4: *"Yeah, because it's one space, and the echo…".*
- T8: *"It's too noisy. If we can have like just a class, divided classes, it would be much better".*

- T5: *"Yeah, so because, like sometimes when we are teaching, in the other side, they are teaching too…. And so, it's too much noise over there. So, on this side, I have to put my voice up. So that they can hear me".*

Teachers are aware that furniture and building materials have an impact on noise levels. They are also aware of the impact that loud sound in an enclosed space has on the children.

- T5: *"My children are very small, so sitting on a table, they are moving it all around. So, it is making noise*".
- T2: *"So sound, and you can hear the rain. And when the sun is shining, it…".* MC: *"Oh, it makes that crackling noise!"*
- P1: *"The ceilings being as high as they are; the acoustics. So a lot of noise, so for the sensitive, sensory children, the noise…. Put stuff in the ceilings and the halls so it doesn't echo. … Into the classrooms, you'll see they've got big soundboards".*
- P2: *"And also, I think your sound isn't so good, especially children with processing and concentrating issues.... Like, you and I are sitting here now; that door's banging; you can hear the children there; you can hear her making coffee that side, you see?"*

Floor finish

The majority of the centres had vinyl flooring, which is appropriate for an ECD learning space. The classes that were fitted with carpets were acknowledged to pose problems in terms of hygiene and could impact children who were more prone to allergic reactions:

- MC: "*And does that work? The carpet? And when the children mess?* T6: *"It's smelly".*
- *We have to accommodate those children who are allergic to carpet and all that, yeah."*

The teachers expressed the need for a carpet to provide warmth, but it is not ideal for messy activities:

- T5: *"Yes, we do have a carpet, but we only put it when it's like, the weather changes, when it's cold. Yeah, so we put a carpet, but when it's very hot, we don't put a carpet.*

- P2: *"And I think carpets are not ideal".*
- T2: *"I would always like a carpet where they sit and have their ring time, but then a space where for me, when they play with playdough…. Every holiday we have them cleaned".*

The principal of site E5 commented that during the refurbishment of their buildings, they also installed carpets throughout the centre, not realising that it was not appropriate for ECD learning spaces. P5: *"Yes, but even when the social workers came to do the checks, they said, No! No! No! That's not allowed. The children need to have tiles".*

Colour

The interviewees were asked to comment on the colours in the spaces in the ECD centres. Responses from the participants indicated an awareness that the use of paint colours impacts how a centre is viewed and can provide it with an identity.

- T4: *"Uh, since the school is also in partnership with the NGO, so you kind of know when you see a school from outside, the colours".*
- *P3: "We were just having a meeting that we need to just make our school look better now. We need to paint it. Even inside, the paint is torn; it's coming off. Even outside. Even the areas outside need to be, and we add some playing areas, some tyres to step on or paint. We like to do this".*

Some participants expressed their preference for bright colours. P4: *"The building inside, the walls are all the same colour".* MC: *"Do you think it would be nice to add colour?"* P4: *"Hmm, I would love that. I was telling…, I don't know who I was telling to put some bright colours".*

Bright colours were defined as stimulating by some participants. T1: *"And even, I love orange! But orange is a bright colour; orange is a stimulating colour".*

The teacher at site E3 with red internal walls thought the deep colours were a good choice. MC: *"I noticed that some of the walls are a bright colour. They're bright red! Do you like that?"* T8: *"Yes".* MC: *"Do you think it's a good idea to have the bright one?"* T8: *"Yes! Yes! Yes!"*

Other participants, however, acknowledged the need for more neutral colours in the classrooms. Their preference for white or light grey walls relates to creating a calm environment and creating a background for the display of learning materials and artwork:

- T3: *"Because it's a class, I think it's a, because it is under the place they are there most time. I think it's better that way. When, because if there's a lot of colours, then their concentration will…, it will actually be disturbing them".*
- P1: *"So obviously, white is very hard on the eyes, it's very like…. Yeah, we wouldn't go white. Grey is kind of like what's gone through the whole campus. Sort of the theme is just grey, and that was something that was already done, so we didn't choose because it was already grey".*
- T1: *"I love the grey. It was so calm and peaceful."* T1 continued to discuss her classroom's colours: *"But my walls don't have as much stuff on. I find it distracting. When you're sitting in a ring and you've got lots to look at, it can distract the children a lot. So, I have tried to… so this has been lovely to tone it down with the grey. Um, even my sound board; instead of getting an orange one, I got a cream one".*
- MC: *"So, the walls, do you use a lot of the wall space to put up pictures?"* T6: *"Yes, all the walls".*

Site E5 had black Venetian blinds installed as part of an upgrade. However, the colour seemed to go unnoticed by the teacher, as she acknowledged that she had not noticed the colour of the blinds until I asked her about it. T6: *"I never thought about it, but now that you mention it...".*

From the responses, it seems that colour choices and decoration of the learning spaces are either determined by the principal or the teachers:

- MC: *"Did you choose the colours?"* P7: *"Inside? Yes. I did decorate this class by myself".*
- P1: *"They took the colours that they already had on that side, but they were able [to] choose the colour you know".*

One of the high socio-economic area ECD centre teachers acknowledged that her personal preference influenced the colour choices, but added that she also considered what colours were suitable for a child-centred appearance. T2: *"Talk about colour…. You know, that is a tricky question, because what happens is teachers, this is where I spend a lot of my time so I would like to try and make to something I would enjoy as well, but also age-appropriate".*

Open plan versus separate rooms

The participants working in open-plan learning spaces where three or four groups share the same space find the arrangement challenging. The matter is made worse when the shared space is too small for the number of children that need to be accommodated:

- T7: *"It was very hard to work there. You cannot squatter, like, them together at different ages because the big kids would sometimes bully the small ones".* An additional challenge is creating themed areas in such a small, crowded space. T7: "*There were cupboards for like books and puzzles. There was a corner for fantasy, but it was very hard to work there because, like, you shouldn't squatter together".*
- T5 on what works best in a shared space: *"Ah, it might be better if we have like divided classes".*
- T8: *"It's too small. I need another class".* MC: *"It's difficult because your class is with the babies?"* T8: *"Yes! Yes! Yes!"*

One of the principals overcame some of the challenges of the shared learning space by acquiring moveable partitions that are used to create four separate learning areas for different age groups. The teacher of site E6 also acknowledged the great improvement in moving from a shared learning space to their newly constructed centre with three separate classrooms.

- P4: *"The time I started there, it was open space. I couldn't like that. All the children were too many; even the small ones were crawling. The teacher, they couldn't do… so I asked for partitions…".*

At site E4, a recently installed timber classroom provides a separate learning space for the older class. The separation provides identity and a learning environment more appropriate to the needs of the older children. T4: *"It's nice and small for me. I love that it's down there; it's not up here with the others, so that my kids can concentrate much more better because they are grown up…. Yes! Yes! We can have our own space, and I can identify a child that is slacking behind, that is behind in schoolwork, or doesn't understand anything. So, I kind of give them individual attention and then, you know, kind of help them".*

However, the classroom is very small, and this places limitations on the learning activities, as expressed by T4: "*We need the space, not only because of covid, but then we needed to do activities because sometimes we have to sit down on the floor and just read story time or we have to do some kind of activity for that day, you know, so space is too small".* When asked if she would bring the children to the larger space for some activities, she confirmed the importance of a sense of ownership for different groups. T4: *"This belongs to them. We belong down there".*

The spatial layouts of some of the ECD centres do provide separate classes, but they still require other groups to move through a learning space to gain access to ablutions or to go outside. MC: *"So, does this class have a door to go outside? How do they go out?"* P5: *"So, they go through the other classroom to go to that door. So, when they have to take the children out, they go through the other class".*

Individual versus shared

During data collection, I noted very limited themed areas in the learning spaces. This was different from what I had seen during my previous visits, as the changes required to conform to the COVID-19-related regulations necessitated a simpler layout with less equipment and more open space. The participants confirmed that under normal conditions, the spaces would have structured, themed areas. The need for a quiet space was discussed with the participants. It was specifically highlighted that without themed areas, there are fewer opportunities for individual play and being quiet than before. Teachers, however, still found various ways to provide some quiet areas:

- T2: *"… Think in most classrooms, in a preschool classroom, you should have a book corner, a puzzle corner, and a spot where you're going to put your bags and that".*
- P1: *"Each classroom had their own little reading corner. So, it's like, little like library area setup with all the books and cushions and things where they could just go into the corner and relax on the cushions or the beanbags or whatever with their books and quietly play".*
- T5: *"A quiet space, no. No, but I have a book here and there. So, they have to read it on their own. So, like a picture reading. Yeah, that's all I have. But they do read the stories, but it's not very quiet".*
- T6: "*Usually, children sit down on the table when they don't want to do anything…. So, I will see well, this one is not okay, then I will go and ask if she or he is okay".*
- T1: *"What I do is, especially if you see there's anxious children, that they need to just sit and do a puzzle or a read a book or whatever, then I will actually take them to the back of the classroom…. So, at the back of the classroom, and often, I turn the light off too. Because somehow it just calms them down".*
- P2: *"So we've had, we've been able to make it more homely in the past. I mean, we usually have carpets, mats for them to sit on. They have cushions that they can sit on versus the cold floor and mats, just".*
- T2: *"… They've got a cuddle box where they would get into that and put a blankie over their head and sit there for a bit".*

The role of an area of the class as a 'home base' was also identified by T6: *"Yes, we're using the tables all the time because we have to take the toys from their areas to put them on the table, so that child.... And during the story time, they sit on their home base".*

Ablutions

The ablution facilities in the ECD centres provide the basis for the number of children that they can accommodate. The participants from the low socio-economic context were familiar with the requirements, quoting the number of children permitted per toilet. E1: *"So, with the toilet facilities at the moment here are supposed to take 80 at least. Twenty per one. So now is enough*

if anyone wants to come here. … But that does mean that the older kids have to go through the classroom to get to the toilet".

However, in several of these sites, the position of the ablutions is not ideal, as it requires groups of children to move through another learning space, or to go outside to reach them. In some cases, the toilets are too far from the younger children:

- T6: *"Because I have to leave other children to go outside for a child who's going to the toilet and leave those behind. I just wish that the toilet was inside. Maybe it would be more easier for the teacher".*
- P6: "*Okay, for them for the toilet, they have to come into the building, through the little ones, and then the toilet".*
- T6: *"We supposed to have toilets for the kids inside…. We have to carry the umbrella for the child to go to the toilet. It's not that far, and they're walking on the veranda".*

One of the teachers thought the interaction caused by older children moving past their learning space was positive, as it encouraged some interaction between the age groups. MC: *"And when the grade R children come up to use the toilet, do they look at them?"* T5: *"Always. They always like to greet like, 'Hi! Hi!' It's not a bad thing. It's really not".*

The recently constructed centre on site E6 includes child-sized toilets and wash hand basins. The teacher explained that the children appreciated this child-centred design feature. MC: *"And the children, how did they react when they came here?"* T7: *"Ooh! They were so happy! They were so happy, and they were so excited! Because they have small toilets, for like for their size, because up there they were using the bigger ones".*

Site H1 has ablutions that are accessed directly from the learning spaces, and this is seen as an essential feature. P1: *"Out of two classrooms, so every classroom got a bathroom…. Especially with the younger classes, to have them right there, you don't have to go with them or check on them. You know that they're not getting up to nonsense".*

Another participant commented positively on the inclusion of mirrors at child height in the ablutions. T3: *"… Got their mirrors and all the stuff. Everything is there for them to be comfy".*

A concern was raised at site H1 that the ablutions needed to include natural ventilation. T1: *"Bathrooms that don't have windows are not great, but we do have extractors".*

It was noted that only site H1 includes a disabled toilet facility, although it is not in an ideal position as it is located off of a learning space. T1: *"Because that was for the disabled. So now that classroom, and my classroom, and all of us ladies—there's six of us—think it's free, and so next door can walk in and distract, and that has happened. But it's the adults walking through".*

Relationship between the inside and outside areas

Some of the participants have particular views regarding the relationship between the inside and outside spaces. Most of the low socio-economic sites have limited flow between the inside and outside areas. Despite this, it was noted in the centres where the opportunity for flow has been created by the inclusion of double doors or sliding doors that the teachers express their preference to keep all the children inside and only take them outside during scheduled free play time.

- T5: "*Would you have some children inside? Some children outside? But the door is open, they can move. Or not? No".*
- P1: *We've actually now ended up having to get baby gates put onto the back doors so they can still open the back doors".*
- T1: *"When the children start at the beginning of the year, they go to those doors, and they want to run to the playground, or they want to run to their mummies, or what have you. So, I got them to actually put the security gate there, so that we can open the doors to get ventilation".*

Views out of the big doors are also seen as distracting during specific teaching activities. T7: *"I need their focus and concentration only on the morning ring because I have to do eye contact with them, so we sit and like… they sit on the other side. Then they don't see outside".*

At site H1, the classrooms have doors on two sides of the room, and this is seen as critical for cross-ventilation: T1: "*We've got a big door that side and a big door that side. So, there's beautiful cross-ventilation".*

At site H2, some of the classrooms have external doors, and these are left open most of the time, unless there is a child who has a tendency to run off. T2 feels that these classrooms are better suited as ECD learning environments.

- P2: *"They'd be open as much as possible. If you've got a runner…*".
- T2: *"I think fresh air is so important".*

Spatial qualities

The participants from the research sites situated in the high socio-economic context provided a broader discussion about the spaces. Both of these sites are complex buildings, with more learning spaces and other support spaces than the ECD centres in the low socio-economic context.

Site H1 was purposefully built as a preschool, and both the principal and teacher appreciate the consideration for a child-centred design:

- P1: *"It was built as a school. It had a lot of space, and it was actually lovely. It actually worked very well, having that whole U-shaped…. That kind of thing works. A pre-primary works when you have like this with your U and all your classrooms facing in with your playground in the centre, where everything looks towards the centre".*
- P1: *"The big classrooms, the big high ceilings, feelings of cool. There's plenty space, plenty air. The storerooms. Good thought was put into the storerooms, and each classroom has a beautiful, big walk-in storeroom because for teachers, there's never enough storage space".*
- T1: *"Our hall doubled up as the art room, so if they wanted to go and be creative rather than running outside, they could go and do art".*

Some minor changes were made since they occupied the school. P1: *"So, where the babies are actually sleeping, we turned that into a sleeping room. That was actually meant to be a staffroom. We don't need a staffroom. The staffroom is not something that the pre-primary teachers use.*

Additional space is included in the design for activities. MC: *"There's a corridor running throughout the school. That's not used as any kind of activity space? That's just for movement?"* T1: *When its weather like this, then you'll find the yellow and the green. They'll do hopscotch, and they'll do games. Counting and those types of games".*

Site H2 occupies part of a church building, allowing some flexibility by means of a multi-purpose room, as discussed by T2: "*I utilised that room* [multipurpose/therapy room]. *I love it! Those little children that are… hyper, I take them into there, and they jump onto the trampoline. They'll go on the little board with the wheels on. They'll go on wheelbarrow. My assistant will help me with that as well. And also, to build up little obstacle courses and to do things as well in there; it's a great space. And obviously, our OTs use it, and all their apparatus is there. We have that space for the therapist to use, the OT, even the… so to hang and balancing".*

As the site has not been designed as a preschool, there are some features that teachers would recommend, namely the inclusion of a storeroom for each class, wash hand basins, and surfaces that are easy to clean:

- T2: *"I don't like a cluttered space either. A storeroom is a dream for a teacher or a stock room, because then you can put all of your goodies and all your materials".*
- T2: *"It's important also to have your own basin, because if you're painting, washing your hands when they've got glue…. And it's also in an ideal world you'd be having an area where you'd be doing art, so an art room then. That would be fine, then you wouldn't need a sink in your own space"*

She further considers a communal display space that all age groups can use as an essential part of the ECD learning environment. T2: *"Usually, you'd have some display out. So, you use the space to kind of… to get the children thinking about it? That space is not ideal, the… because it is great*

if you go to any preschool, it's normally at the entrance for here, and I do think it should be in like the heart of a school".

The participants at site E5 identified the location of the kitchen as particularly problematic, as it poses a danger to children. T6: "*It is an issue! I wish the kitchen can be outside, because you never always look for child, and a child can go to the kitchen without even noticing".*

Outdoor environment

What is the role of the outdoor environment?

The amount of time that children spend in the outdoor play area ranges from a 15-20-minute slot to a one-hour slot. The high socio-economic sites indicated that the children have two 'break' times: a short time outside early in the day and then a longer session later in the day:

- T3: *"And how much time do they spend outside of their kind of day, usually? It's 15 to 20 minutes".*
- T8: *"How much time would the children spend outside? So, about 45 minutes".*
- T4: *"So, our play is from 10:50 to 11:50".*
- T1: *"Then the second break, we go out there".*

The participants all reported that the children go outside as a group at specific times of the day for specific lengths of time. This means that the children have no free movement between the indoor and outdoor environments, as the teachers prefer to keep them together so that they can watch over them:

- MC: *"Do you think it would work if you had, if you had an arrangement where sometimes they can go out? Or is it just because you're on your own?"* T5: *"Like for now, I don't have an assistant, so it will be a problem if I go outside and nobody will look after them".*

Concerns about playing outside were raised by the participants from the low socio-economic area. Their concerns relate to a lack of space and adequate play equipment:

- P3: *"Okay, the little kids, we don't have enough space".*
- T8: *"We got no sand pit. And the other one, I need to add to another end a jumble gym".*

The centres use a rotation system to deal with play areas that are small compared to the numbers of children, and site H1 has included an additional natural play area:

- T1: *"So, we rotate. So, one break, they're there with all the apparatus, and then we've got our beautiful natural space, so that compensates".*
- T7: *"We go out. We go out at half past ten for a snack. First, the snacks. The babies go out for play at half past ten. So, like, we take turns".*
- P1: *"This back playground wasn't originally part of the school, so this with the number of children with the big spaces, having this play area in the front obviously wasn't adequate for the number of kids".*

Some participants at the other sites that have adequate space and a range of play equipment, however, report that there is a danger of snakes and that the weather conditions impact outdoor play:

- P6: *"It's not nice, because in this area, we have a lot of snakes".*
- T8: *"Yes! Yes! Do not go outside if it was winter, because she was very cold. Some of the parents… they must… do not go outside… my child".*

It was noted at the centres without covered play areas that rain impacts negatively on outdoor play as children are kept inside:

- T2: *"Yes, but they know if it's raining and we can't play, then they have to do puzzles and like Lego games, and we just have to do our own games".*
- T1: *"No. Unless you are brave enough to realise or understand taking a chance because your kids are going to run for all those puddles".*
- *T1: "Because the one school I worked in was lovely. They used to keep gumboots at school. And then, when you had your rainy days, it was all ready".*

Centres with a covered outdoor area used these spaces regularly, specifically in poor weather conditions:

- T3: *"They eat; they're going to eat outside* [on the covered patio] *because, just to make them a bit free. Not unless if the weather is not good, then they stay, yes".*
- MC: *"Do you use this little veranda outside here at that side?"* T6: *"Yes, we are using it".*

There was a general consensus in the interviews that children enjoy outdoor play more than indoor play:

- T1: *"We love the outside. Outside play is just so lovely. Like I said, the first little break, they have they go outside. They run around, use the jungle gym".*
- P4: *"Yeah, but if you are not taking them outside, they ask you why you are not taking outdoors. They need to".*
- MC: *"And then, do they enjoy playing outside?"* T4: *"That's the best part of the day. They just asking, 'Miss, after snack, can we go and play?' And I'm like, 'Yes, we are going to go and play'".*
- MC: *"Is that their favourite space?"* T5: *"Of course. Every kid loves like going climbing out on the spider nets, and sometimes it's very scary, like when she like maybe going to fall and like going to catch them…. So that they will be happy because they love going outside".*

Some of the participants shared their love of the outdoors, while others noted that there are teachers who do not enjoy being outside:

- P2: *"So what do you think is the best quality of this school? Definitely the garden and the trees".*
- T1: *"But for me in my age group that I've got, I really love the outside. Yeah, it's a personal thing. Because when I hear there's some that really don't and if they can get out of going there they will. The adults! the adults!"*
- T4: *"Yes, it's balls, hula hoops. And they also, there's a kind of obstacle course that we also have".*

The role of natural materials in providing a range of textures as part of sensory experiences was highlighted by the teachers. They referred specifically to water and sand play activities, along with natural elements such as plants and flowers:

- T1: *"So, the sensory tray is when we'd go out to play. So, we'd have our water play, so we'd have all our textures, whatever, sand and what have you".*
- T5: *"Especially water; they love it".*
- P1: *"We have a wonderful garden, and they real grass, which is fabulous. Yes!"*
- T1: *"Then the second break, we go out there. And that's natural nature, climbing, flowers, and sensory garden. You can actually see their attitudes are different, their fantasy is different, the way they move is different, which is good from time-to-time".*

Site H1 has access to a wetland as part of the campus, providing a broader scope of natural features:

- T1: *"We've been to the wetlands because we've got the wetlands".*

The participants described the inclusion of artificial grass at some sites as practical, as it provided a suitable surface that could handle the high traffic around play equipment. It was, however, noted that the surface becomes too hot in warm weather:

- P4: *"Yes, it's right for the size of the children. But maybe if I can't get the artificial grass, maybe I need to add normal grass because when it's raining, it getting muddy".*
- P1: *"In this space, it does work quite well. The only downside to the astro is when it gets really hot and the astro gets hot. But fortunately, we hose it down, and that cools it down quite quickly".*

There were some differences in the views of the participants about children playing in mud. While some recognised the sensory experience as positive, others described mud as messy:

- MC: *"Do you let them play in the mud sometimes?"* P4: *"No, it's a mess".*
- P2: *"We have a mud day. Ja, so those are my favourite".*

Most of the low socio-economic sites feature a vegetable garden that contributes to the children's learning as well as providing food:

- T4: "*And what granny does and what they do. How they plant and what they do. So, we kind of just stand in the window there and just see".*
- MC: *"And the vegetable gardens, do the children themselves grow anything or not?"* T6: *"We do, we do…. Yes, we do go there for them to water all the plants which are there".*

Outdoor play areas and equipment are described by the participants as supporting the physical development of the children at their various ages. The open spaces provide more freedom of movement, which is critical for young children:

- P1: *"A lot of the time they're outside, it's for them to run and get rid of some of the energy. And they're not putting equipment out, as opposed to before, where there would always be loads of equipment—hoops, and balls, and things for them to play with out there".*
- P2: *"I think that jungle gym is amazing. The big jungle gym…. We had it specifically designed for the issues we were seeing. So, the core issues, so things can be adjusted, and ja, lots of pulling, pushing, climbing, extending, you know, going with force".*
- MC: *"And the outdoor play equipment that you have at the moment, do you think that's good for the age that you have?"* T6: *"Yeah, it's age-appropriate".*
- P1: *"The space back there to run. Because even though we have this space, having the jungle gyms and things, the feature limits your space because then they can't really run. They can play because they've got the space, but there's too much happening for them to run".*

The participants described the importance of shade in outdoor spaces due to the hot summers experienced in their contexts:

- T1: *"And now we're getting more and more shade, and what have you, because at first, it was very hot. Especially synthetic, it was hot, very hot".*
- P2: *"Generally, we just set it up in the shade though, or either under the tree. And that works fine. We try and keep them outdoors as much as possible".*

- MC: *"So, the play area is quite small, but you have this covered area as well. Do you find the children are on this under the roof a lot, rather than in the sun?" T7: "If it's too hot, we don't even let them go there. Yes, because we think of their skin, and some of them, they got allergies. So, we just use this space* [the veranda] *even if it's raining. We use this one because the rain don't come here".*
- T6: *"No, we're using all the areas because they're also playing with the motorbikes. Yes, so we have to use all areas. And there's a big tree there for shade and all that. So, they always using the whole area".*

6.6.5 THEME FOUR – ECD MICROSYSTEM: PLACE

This theme arose from the participants' responses describing the intangible influences on their ECD learning environments.

Pedagogy

The interviews touched on the pedagogic approach to provide insight into the learning approach and how this impacts the kind of learning atmosphere that is created. This aspect considers the types of activities that a space needs to accommodate and how the learning environment supports the specific approach to how children learn.

The participants reported following the curriculum structure stipulated by the National Curriculum Framework (NCF) provided by the Department of Education. The current curriculum is the CAPS programme, and the previous programme, NELDS, is still considered by some centres:

- P2: *"The government have got the CAPS curriculum, so we've used those learning areas as our framework, and then we've adapted it to suit ourselves and to extend it you know, so that we're covering the basics for sure…. And before CAPS, there was a programme called NELDS, and so the NCF has kind of taken CAPS and NELDS."*
- P2: *"… And how to take the best of both and put together this framework. And that's what we use as our guide. But most of our stuff, at the end of the day, is really our policy, and our whole take on pre-primary education is to learn through play".*

The notion of learning through play was evident in most of the centres:

- P2: *"People think as pre-primary as running around like wild little things. It's very structured, very intentional, and we work around themes, so that's also nice. So, our stories are related to themes. Our concepts are related to themes".*
- *P1: "Everything is play-based, but obviously, play with a purpose. It's specifically planned play with an outcome that the teacher will be looking for".*
- T3: *"Yes, they play a little bit. Then coming back. Also, for time, they eat and then they play a little bit with those puzzles because there is the puzzle to use so much for now".*
- P6: *"Yeah, because during the morning, they are learning and eating their snacks.* MC: *"It's structured".*
- T1: *"Because I was sitting on the floor while they were playing dress up, and while they're sitting on the floor, they're learning. Because apart from the fine motor skills from learning how to dress themselves or whatever, you are listening to them, because they love it when you're sitting on the floor with them. And they love it when they can come and chat to you, and you can have a little conversation, and they are learning new words. And I'm also learning new words and how to decipher some of the things they say. Yeah, and so you're learning constantly, but through play. So, all the learning, the language, is through play".*
- T2: *"I'm doing Grade 00 and getting them ready for Grade R, so you know what is expected for junior primary. You know, it's not all worksheets; it's learning through play".*

  T2: *"It's definitely learning through play and talking and connecting. That the children spend a lot of time exploring on their own. There's a lot of being outside as well. Which is normal pre-school".*

A number of the sites are supported by an NGO that provides all their teaching and learning materials. This programme includes guidelines on how the day must be structured and how the space must be used:

- T4: *"Uh, yes, CAPS. I follow that. And here, they follow the GROW curriculum. Yes, for here they provide the lessons. They've got lesson plans, and then they've also got; it's term one,*

term two, and term three, and it just tells you everything that you need to know for the whole day".

- T4: *"Everything is well structured. The programme, you know, everything. It's just you have to do them on time, and you know, it's just…".*

All the centres used English as the primary teaching language, even though the low socio-economic sites' population is all isiZulu speaking. The displays often show both English and isiZulu descriptions.

- P3: *"Because everything, most of the thing, education is in English. Everything you are exposed in, it is in English. So, even our little ones do need English, but not to neglect our vernacular language".*

Some of the teachers acknowledged their role in consistently creating a learning environment that is suitable for young children's learning:

- T4: *"It's just you have to be creative as a person when dealing with young ones. You have to come up with different ideas each and every single day, and they shouldn't know that today we're going to be doing the same thing. The routine shouldn't be the same. It has to be kind of different when working with them".*
- T1: *"Because emotionally, you have to be involved. It's not so much the academics, but it's also physical. You're running with them all the time, you're training them, you're social, because that's what you've got to do. Get them social for the next step so that they can become independent".*
- T1: "And *you can get lost sometimes, not listening to them because there's so many. So, you, as a teacher, need to remove yourself with children and get to know where and how they are. And you hear some interesting things".*
- T1: *"So you can use; it's up to you individually what you can utilise to make your morning as well, nice, and of course the children, but if you're enthusiastic, it rubs off on the children".*

The teachers commented on how the physical spaces support the learning approach:

- T6: *"No, in the morning, when you're doing the morning reading, we sit on the home base. When we're doing the activities, like creative activities most of the time, and sitting at the tables, and when they're having their snacks and lunch, they're sitting at the tables".*
- MC: *"Do you think the environment, the way it's designed now, do you think it's helping the process?"* P1: *"I think it does. It is inviting the way that it's set out, and the structures, and the playgrounds, and the jungle gyms, it does invite play".*
- P6: *"And the other thing is that the four years and five years, they are able to say things. They speak, so when we decided to take them all there so that the younger one will hear the older one".*

The principal from site E1 spoke about the homes the children come from and how removed they have become from traditional childhood. They used outings to support a greater awareness of their cultural heritage, knowing that the immediate environment of the centre could not provide this:

- P3: *"Yes. Yes, sometimes when we teach them, we used take them some other houses to see that. We like that because our children, who are born here, they don't even know. Sometimes, they can see the cow, but they don't know how the cow is milked unless we tell them".*

In contrast, the principal at site H2 referred to using technology aids sometimes to support learning:

- P2: *"The very last resort. We do, on the odd occasion. We use a clip of YouTube or whatever that has got educational value if it's short and really going to make a big difference. Or very interesting. We will do that. But it's not sitting watching movies and things like that".*

The outdoor spaces formed an important part of the pedagogic approach in most centres:

- P3: *"They need that physical development".*
- T5: *"We were doing a gardening theme, so the household, like on the window day, because they can't get inside, they watch, and they watch granny".*

The concept of thematic areas in the learning space was understood by the participants:

- MC: *"So, it was more thematic?"* P1: *"Yes. And during that time the kids were then, almost like an…, if you think of a big school, their break time where they could actually choose wherever in the school they wanted to play, and wherever they went there was a teacher on duty, so not necessarily their class teacher, but there was somebody on duty there. And so, the four classes would mix, and they would actually have that interaction with each other".*

The role of children in directing their learning in the environment was considered:

- P1: *"And also just having to use like more of their own imagination and go and play and run and play their own imaginative games outside as opposed to using equipment".*

Participants noted that children need variation in the ECD environment, as this is critical for young children:

- T1: *"But they still children. Their attention span is still so much shorter than what we think they should be. So, they need to stop whatever they're doing—scheduled work, planned work. We need to stop that, take a break, and do the fantasy play. Go outside and stretch out legs, so play all the time".*

The principal at site H2 described how the environment supports the whole school:

- P2: *"And we usually have music. Or you will hear music playing throughout the day. There is still that peace in the school".*
- P2: *"And we used to have a large group three times a week. So, we used to all come into the room next door, and one of us would do a little assembly. So, we would sing, and pray, and do a little story. Wish people a happy birthday".*

Children's Voice

Children generally have little opportunity to express their views about what they want their learning environment to be like. However, the participants responded positively to the idea of involving the children in these decisions:

- P3: *"At the moment, we have just talked with the teachers. We haven't talked with the children, but we have to involve them".*
- MC: *"You think that's also good—to ask them what they would like?"* P3: *"Yes, to ask them what they would like to see in their building as well".*
- MC: "*Do the kids get involved, kind of decide what it should be like, or is it only from your side?"* T1: *"We've actually done it ourselves".*
- *T2: "Maybe I should ask mine now, since it's the end of the year and they are more switched on. But there are certain things that you're restricted by. But yeah, that's a very good point. I think most of it is done by the teacher personally".*

On reflection, T1 considered that there are some instances where she does allow children to make decisions:

- T1: *"But there are times where, on the blackboard, the children have done something. And I'll say to them, 'Okay, how do you want to decorate it?' And then I get the Prestik or something, and with their art or they'll move this, and so they have a time of decorating their environment. 'This is your little place, so let's see how we're going to make it pretty'".*

The contrasting views about the roles of children and teachers relate to the role of adults in children's lives. The ability to make decisions about their environment is seen as part of growing up:

- T1: *"I've had, as a teacher, had to come to terms with that. Because it's not just the children, it's us as well. I've had to come to terms with that. That it's their environment; it's their classroom too. So, if they don't want their symbol on that side of the shelf, why can't we move it?"*

- T2: *"Yeah, because I often say to them, 'would you like to have a snack now or would you rather do a puzzle?'"* MC: *"So, you give them options?"* T2: *"Yes, and they are learning to put their hands up now".*

The teacher from site E6 commented positively on how the children reacted to their new school building, noting the appreciation of a child-centred approach to the design. T7: *"Ooh! They were so happy! They were so happy, and they were so excited! Because they have small toilets, for like…".*

Inclusive education

How does the centre make provision for children with disabilities or learning difficulties?

Several participants indicated that they need to accommodate children with learning difficulties, disabilities, and those who are sensitive to sensory stimuli:

- T8: *"Sometimes I have got little people, eh child, who have got problem of eyes".*
- T5: *"Yeah, I had one child. Yeah, I had that one child who has been like slow on everything, and she is three years now, yeah. But she acts like she is two years*".
- T1: *"So, a lot of noise, so for the sensitive, sensory children, the noise".*
- T2: *"And also, I mean you've got my one little chap who cannot speak one word of English, then you've got another one from a divorced family, and another little boy who looks like he's eight, but he's actually five, and his emotional development is above a 5-year-old's, so you sort of have to be sensitive to all of that. And that's why I do love that room".*
- T1: *"We do that whole sensory integration thing, is becoming more and more of a big issue for children in terms of, it causes anxiety, it just causes a lot of stress".*

The teachers commented that the learning environment does not necessarily support the needs of these children:

-T6: *"Yes, I do have. I do have those children".* MC: *"And do you create a space in the class for them? Do you have to spend more time with them?"* T6: *"Yeah, whenever I'm doing*

lesson plan, I have to also plan for them because they need special attention. We need activities that will accommodate them. We've had a remedial group".

- T1: *"I do try and create that. What I do is, especially if you see there's anxious children, that they need to just sit and do a puzzle or read a book or whatever, then I will actually take them to the back of the classroom".*
- T1: *"Too much light, the sensory children again. So as soon as I want to calm them down, I do turn the lights off anyway".*
- T2: *"And also because I've got a few little boys that are hyperactive, so they need that sensor to settle them and that high pressure to…, that heavy duty exercise just to get them quiet down, to regulate them again".*

Teachers created a quiet space in their environments for one-on-one or small group interactions:

- T5: *"Uh, it's just to help her because I see it from the beginning. So, I was just like when they are sitting there...".* MC: *"Spend a bit more time?"* T5: *"Yeah, a bit more time, and I don't just put her with the smaller kids; I put her with the old ones so she can see the other ones, what they are doing. If she's getting confused, then I can talk to her".*
- T6: *"Yes, we've got one area so that they're all using them. So, I have to give them attention whenever… there are areas I would be with them".* MC: *"Yeah, it's where they are. You just follow them. I see".*
- *T1: "There's four places around the table, and there's three around the table, so I can interact better, have their quiet time by themselves. And then my intern and my assistant actually know to keep the other children busy. Because they need, I need to know how they're really feeling".*

At sites H1 and H2, inclusion was provided by acknowledging that there are times when some children's needs are different from those of the groups.

- T2: *"We did have indoor play, especially if it's very hot. We have a place where we set up in one of the classrooms, in one of those two outside classrooms where there's indoor*

activities. Where the indoor activities set up so they can do puzzles or build quietly if they want to. And some children prefer that if they find the noise of it's stressful outside.

- T1: *"Yes, I've got children who complain, 'Oh! When are we going to be back into the classroom?' Because it's almost like they enjoy being boxed in. So, it's your teacher and one or two children that prefer being boxed in, rather than the freedom. And it's not just a security thing, or a comfort thing. It's just what they prefer. Because some people in their homes are outdoor people and some people aren't outdoor people. That's how it works".*
- T1: *"That, and especially with the children, they can be a little bit stubborn, they don't want to put something there".* MC: *"Just because you said so?"* T1: *"Yes, and then you say to them, 'Okay, I'll tell you what, we're going to still keep it there, but where over there would you like it?' And then they'll put it there, and then they've won. So yeah, I do do things like that in the classroom".*

Only site H1 reported having a disabled toilet facility, although the positioning in the centre was not ideal. T1: *"They put the special wheelchair in my classroom. They were thinking the hall is there, then it's my classroom, so if the people were in a wheelchair…. But there wasn't a ramp, plus, if you're in the classroom, you've got all your school tables. How do you negotiate that?"*

Belonging

Do children and staff feel secure, and do they have a sense of ownership in the centre?

The principal of site E1 considered the school to play an important role in the children's lives, providing a sense of place. P3: *"They enjoy the place because it's much better than home. Yes, it's much better than home to be here. Yes, most of them, they're from, some from single parents, some from people who rent the rooms. There are some who rent one room. There are some who are in the house; there's extended families; there's grannies, aunties, uncles you know in this. And to have enough equipment to have someone take care of you. Yeah, some are with grannies, where the parents, mummies have died. So, they prefer really the school than stay at home".*

It was noted that an identity was created by one NGO that supported some of the sites. T4: *"Yes, it's just like an identity. So, the colours resemble GROW, and you just know from the start that*

this school is associated with GROW. Yes, so, it's also the background to know, that's my school. They can differentiate between their school and somebody else's school".

The teachers described a sense of ownership towards the learning space that an age group occupied:

> - MC: *"Would you ever bring them up to this area where, when in it's wet, you've actually got cover? From downstairs to bring them here?"* T4: *"No, no, no".* MC: *"You stay away from this because this belongs to other children?"* T4: *This belongs to them. We belong down there".*
>
> - MC: *"So, they feel very at home in their class?"* T6: *"Very, yes".*
>
> - T1: *"That it's their environment, it's their classroom too…. And I have allowed small little things like that because I've realised it does make them feel important".*

The sense of belonging was described as being provided by the physical space, the learning atmosphere, and the routine:

- T2: *"So, the routine is always there. Look, the children like routine. They feel safe, they can predict. Normally, they will seek it. They will come and they will stand near me, and you will know they either want just a bit of love, so I think you need to be sensitive to that. If they battle to concentrate, they'll be chewing chewing gum, or they'll be sitting on a little mat".*
- MC: *"The kids probably need that more intimate, more specific space".* T1*: "Yes, with your teacher. There're times when they're sad".* MC: *"Yeah, they need a place where they feel safe".* T1*: "Yes, that's their security. They're dropped off, that's where they're picked up from, so that's their security* [homebase]*".*

Teacher 2 commented that the need for individualisation is also felt by the teachers. T2: *"It's just nice, I think, to put your goodies on".* MC: *"But you'll also have your own little private, individualisation of your space".*

6.6.6 THEME 5 – ECD CHRONOSYSTEM

COVID-19 Pandemic

How did the changes that the COVID-19 restrictions posed impact on the care and development of the children?

Figure 6-26 COVID-19 theme wordcloud

Source: Author (2022)

Learning environment – physical space, equipment, toys, and use of space

The participants explained that the learning environment had to be more open and clutter free to maximise space and reduce the need to sanitise everything:

- T8: *"Yes, we have different areas. And then during the covid, was must pack up all… And then we do to…, need a space".*
- P3: *"Lot of our equipment; it's not used, it's there. Especially all the, our fantasy areas, then music, yeah, most of our equipment is stood out because of the covid".*

- T6: *"Yes, we were having like six areas. Yeah, it's different now. We have to remove some of the areas so that we can keep the space for all the children, so that we have enough space in the classroom, so that there will be a social distance".*

The principal of site H1 explained that different age groups had to be separated to limit the possible spread of disease. Similarly, only the parents of babies were allowed to enter the buildings:

- P1: *"We've had to be so limited with what we're actually allowed to use and put out, and with the toys being that you know, that you can't have the ages mixed unfortunately at the moment".*
- P1: *"Should we have an outbreak, so that it doesn't spread through the whole school. We're kind of separating the age groups so if we do have something, then at least we have to shut down a section".*
- P1: *"The only parents which come in are the babies, so they come this way and that's how they take their children to the classroom, to the teachers".*

Similarly, the principal of site E5 explained that the health workers were not allowed to use the clinic area as it posed a threat of the potential spread of disease to the children:

- P5: *"In this stage of the covid, no one is allowed to come in. Even the community headworkers, they just go down to the church to ask for the place to do. Because this place is for children. We can't allow people".*

At site E1, the principal explained how they reorganised the space where previously the office area was accommodated in one of the classrooms. P3: *"But this year, because of the covid, now because we have to, we didn't have an office. We were using the class, in the corner. The corner of the class. So, because of the covid, we have to take out the kitchen here because it was the kitchen. We have to move the kitchen up there to the container now".*

The teachers had to remove most of the display items that created a more child-friendly environment in the classrooms:

- MC: *"Your class was beautiful, with decorations here for the babies, but now everything's taken away, and that's for covid?"* P7: *"Yes, that's for covid, but next year…".* MC: *"You will have it back?"* P7: *"Yes, yes".*
- T2: *"We also can't put up their artwork at the moment".* MC: *"So usually, that would be covered with art?"*
- T2: *"Yes, so normally if we're doing a theme, I'd have all my artwork related to it there".*
- T2: *"On the mat, in a normal situation when it's not covid, you'd have some fantasy toys, construction, puzzle, or a reading corner. So tis free , but… ".*

All the participants were dismayed at having to remove the sand and water play areas, as the children enjoyed these areas, and it formed an important part of their sensory experience:

- MC: *"Things like sand play and water play?"* P3: *"Yes, we had all that. We had some here, up here. We had some stands, big basins for the sand and for the water down there we do have, but because of the covid, we don't use it anymore. Because of that, things which need to be touched by all of them".*
- P2: *"No, no sand. There is sand underneath the jungle gym that gets used, but not officially. We just keep working on it often and adding salt, like every week".*
- MC: "*I noticed all your sand boxes are actually closed off".* T2: *"Because of covid as well. No, and in the baby's section, you see they actually emptied them all out".*

At site E3, the children were not able to use the outdoor play equipment. T8: *"Because of covid, I'm not going out. I will take them to sit at the veranda. Because was, we got not enough sanitisers".*

The teachers provided different ways to ensure that social distancing could be maintained in the classrooms. At the low socio-economic sites, the children were assigned to a chair at the start of the day, and they were not allowed to swop chairs. At some sites where space allowed, they also had tables, and every child could sit at a table. At site E5, screens were installed to keep two children separate when sitting opposite each other at the table. At site E1, each child had a small

blanket to sit on on the floor. Site H1 used hula hoops to designate an area per child, and site H2 had squares marked out on the floor of each classroom:

- T3: *"Yes, they're sitting on the chair now, on the chairs, because there's lot of them so they can't sit on the floor".*
- MC: *"You give them a chair at the beginning of the day, and that chair, they stay on it?"* T8: *"Yes".*
- T3: *"Because we, as they were still small, in small group, we used the blanket, and as you said that, they are coming back. It was, we had to use the chairs…. And also use the chairs on the right when we taking back the tables to write. When we finish, we clean them and put it back".*
- T3: *"Yes. Also, the story time, they have to sit at their chairs. also without their tables. Before, it would be on the carpet".*
- P2: *"But we took out a lot of the tables, and also there's also the physical distance".*

The participants explained that many of the arrangements were to reduce the chance of children touching each other or touching the same equipment and toys as each other:

- T6: *"No, the children were going to the areas to play and play together".*
- P2: *"They get a little activity tray rather than put out our big area of construction or whatever. Each child gets a little tray of goodies that they pay for in the morning. So that's a whole new..., and all that has to be cleaned every day. And each child gets their own, so they don't touch each other's".*
- T2: *"Now, due to covid, we have a box in our staffroom with the goodies inside there with books and games, and there's pictures all relating to that".* MC: *"And the reason for not having it there is that the kids will touch things?"* T2: *"Yeah because of the covid".*

The principal at site H1 commented that the children spent more time outdoors. She also thought that the children had become more imaginative as there was less equipment that pre-empted their play. P1: *"At the moment, the teachers will take their kids outside to an area, and that's where they'll play, or they'll be inside their classroom, or, you know, as a class, they'll get a specific*

area and play. And with very much less equipment. So, a lot of the time, they're outside. It's for them to run and get rid of some of the energy, and they're not putting equipment out, as opposed to before, where there would always be loads of equipment; hoops, and balls, and things for them to play with out there".

It was noticeable that the classrooms had very few soft toys, carpets, or cushions, as these items are more difficult to keep clean and sanitised:

- MC: *"Do classrooms have a quiet corner?"* P1: *"Yes, so unfortunately, again with covid, it's put a spanner in the work, so pre-covid, and we're hoping that by next year, we'll be able to get back to it".*
- P2: *"No. It's not that warm, cuddly feeling".*

Most of the principals said that they could not offer aftercare facilities during the covid restrictions as they had to allow for the spaces to be cleaned in the afternoons. At site H1, the arrangement for the aftercare children had to be changed to keep the children in smaller groups rather than all together in the hall area as before.

- P1: *"And then the kids who stay for aftercare, for their cooked meal, they used to go to the , and they used to all eat together. But now we do the same as the snacks, so they stay in their classrooms that they're using in the afternoon, and like just take it to them in the classroom. So, we've got two classes per age group, and then so for aftercare, because a lot of them do go home, they just combine into one".*
- T4: *"We no more have aftercare. It's like if a parent is late, maybe a parent or two parents are late then we kind of do stay, but… we're not supposed to stay after".*

Numbers of children and staff

The principals and teachers all reported that there were fewer children attending the ECD centres than there were before the COVID-19 pandemic lockdown restrictions started. At the research sites in the low socio-economic area, most of the sites had no children during the August site

visits and significantly fewer children during the November fieldwork than there were before the lockdown.

- P3: *"Then, after covid, we have few of the pre-school children. Because before we have 60, but now we have 35".*
- P7: *"Yeah, I am planning that next year we'll have to get more staff, because this year, because of covid, we were at home for six months, I think, so we were not working, not getting paid. So, three of them decided to leave the crèche and find another job".*
- T7: *"Each class got like for about 15, 16 of kids. Each class, because of lockdown".*

At site E4, there was only one child in the 0-2-year age group. T5: *"So, at the moment, there's only one little girl in the, in the young class. There's one that's on her own. She's a bit smaller so… but sometimes she comes on the side and just plays".*

The reasons for the low attendance rates are primarily related primarily to the employment status of the parents:

- T7: *"Some of them, they say they have lost their jobs. Some of them are not even back to their work. But they promised to bring their kids next year".*

Cleaning / sanitising

The requirements for cleaning and sanitising spaces, furniture, and equipment were highlighted by the participants as having a major impact on the running of the ECD centres:

- P4: *"Because the water section and sand section, I closed that. Even the bricks, I took them away because you can't wash them".*
- P1: *"We employed a new staff member literally just for cleaning since covid. So just cleaning toys. She'll go into every classroom, and the toys that have been used for that day, she'll clean them for the next day".*
- P1: *"But because of the cleaning and sanitising, everything is sort of really minimalistic in the classroom. Everything that's in the classroom at the end of the day has to be wiped*

down and sanitised, so if you've got a whole library full of books, every single one of those books have to be taken out and wiped down and sanitised at the end of the day. So, the teachers have literally gone and taken all their libraries and put them into their storage and just sort of kept out just a few, five or six books, and all the cushions, and of course anything fabric is hard to clean. So, all of those have been put away, especially in our baby classes".

The requirement to screen each child for possible infection every morning. P1: *"So normally, that's how it's supposed to be, how it used to be. Obviously, with covid, you try and eliminate as much of the traffic within the school.... In the morning, they open the two big gates on each side of the playground here, so they don't come to the office. They come to the gate, so our smaller groups are this side and our older classes are on that side. We screen, do temperature checks at the gate, and drop their kids off at the gate, and now, especially because the kids know their teachers, they know their routines, they get themselves to the classrooms".*

The requirements to sanitise have placed an additional financial burden on the centres. T2: *"We've spent a fortune on sanitising, cleaning, and we are so blessed full-time assistance".*

All the participants reported that the sanitisation requirements required the spaces to be emptier, with minimal equipment. P1: *"Yes, just to try and reduce".*

Responses to change – children and adults

The participants reflected on their own experience in adapting to the changes with difficulty:

- T4: *"Since we had this lockdown and the pandemic, the rules kind of changed".*
- T5: *Yeah, it's really hard, because now we have to think of something when we like on that day, we have to do the same thing. Water play? So, it's then we also think about other things that we have to do".*
- T3: *"Yes, lot of them. It's so hard. But we're getting used to the situation because we can't do anything".*

- T3: *"Very different, I'm telling you. Anyway, but I can allow it... because it's the situation that allows us to do that".*

The feedback indicated that the children seemed to have adapted better to the changes than the parents and teachers.

- MC: *"How do you think the children responded?"* P2: *"They just got right into the routine, and the parents were more stressed than they were about the changes and that they're not gonna be able to cope, and how they're going to feel. They've coped absolutely fine!"*
- P3: *"We were bound and different everything. But then time goes on, but still. But children, because they're children* [clicks finger]*".*
- T1: *"Children adapt, but they still children".*

When asked how the children reacted to being confined to a chair or square space on the floor, it was noted that they did show some frustration at being confined:

- P2: *"Ja, they try. And they're not bad because they've got their little mat to sit on. They've actually been remarkable at staying. Because they get a little basket of toys, or if they're sitting there, that's their spot, and they're looking at the teacher from there. And they do go over the line and they do chat".*
- T2: *"Covid! It is also amazing how children do adapt and you hear about it so often, but you think, and I'm not talking about trauma, but they do. That today I could see they were really restless and just sitting and playing in their squares. You can see they're agitated with that and are wanting a bit more freedom".*

Some participants felt that the children's learning was not affected as they were still following the same programme.

- P7: *"The programme is not different. We are doing the same thing. The programme that the children are few. That's the problem we have".*
- P1: "*The stuff that the teachers are putting through, which is their, what you'd call their assessable work… that kind of stuff hasn't changed. So that learning is still the same".*

The principal of site H1 observed that the children's free play time was different from what it had been before the pandemic:

- P1: *"So this is really affecting their break time. Their outside play time obviously… their free time. Not so much their structured classroom time".*
- P1: *"it's more the accidental learning which has changed a bit. Where they are using now more of their imagination opposed to having equipment set out for them already".*

The participants highlighted a positive effect of the reduced daily structure as allowing the children to become more imaginative:

- P1: *"And also just having to use like more of their own imagination and go and play and run and play their own imaginative games outside as opposed to using equipment".*
- P2: *"The kids come up with new ways of using it… they really are creative".*

The teachers at sites H1 and H2 found ways to supplement the missing elements of sensory play.

- T1: *"I also love sensory play, and unfortunately, can't have those big trays like we used to because lots of children, and I'm missing that because I loved doing the sensory play".*
- T1: *"I've been bringing sand from home and putting them in little ice-cream containers, so they still have that. And before playdough, you used to be able to keep for a while, but you can't do playdough now. So, I've been bringing flour and water, and you know, we can throw it away, so that's very important. And so, we've substituted, but there's ways to find it. And I love nature play; bringing in sand, leaves, all-natural stuff".*
- T2: *"And you know now it's hard because we're outside and we're not doing the sensopathic trays like we did. Now we've got cat trays, and we play with… this week they did it with rice".*

At site H2, the children did not wear any form of face mask or screen, and the principal felt this was a relief for both the staff and the parents, as it is difficult for children of such a young age to wear these protective wears. P2: *"Parents are very glad that they don't have to wear masks. Some children do not wear or refuse to wear their masks in certain families. So they, ja, we don't, they*

said up to the age of five. They said four to five can, we should be, could be encouraging the older ones. But we don't".

Some of the participants suggested it would have been very different if the research was done during 'normal' times. T2: *"It would be nice if you could've seen it under normal circumstances. Because then I've got puzzles, a reading corner".*

Community/society changes

Participants were generally dismayed at the impact of the COVID-19 pandemic due to the lockdown period. The communities were affected by unemployment, which in turn caused other social ills. Two of the sites in the low socio-economic area reported break-ins and theft. MC: *"When was it stolen?"* P5: *"In this covid thing. During lockdown".*

The staff could not be paid while the ECD centres were closed, as they did not receive government funding for several months. P5: *"You see in covid, there was no grant. There was no payment because we were not here".*

These sites were supported during this time by local NGOs that provided food that could be distributed at the ECD sites. P5: *"They brought food; they get some sponsors. For the staff and for the children, all the children. They did this twice in May".*

6.6.7 SUMMARY

Each of the themes discussed brings forward a layer of complexity in the contextual influences on the quality of early childhood development and the children's learning environments. The thematic analysis included separating the data into codes and connecting the interrelated issues. However, the ecological systems theory acknowledges the porosity of the boundaries between the different systems (Ferguson *et al.,* 2013). The critical concern of an unsupportive policy framework was confirmed by several of the codes. In the macrosystem, registration and teacher training reflect the policy's limitations, while the broader challenges to ECD reinforce the urgency of the agenda for ECD transformation. The mesosystem highlighted how the ECD sector is hanging

in the balance due to its dependency on donations and NGO/faith-based support to continue its work. The microsystems of space and place included the detailed consequences of the broader challenges to ECD quality. The limitations include physical spaces that are not meeting health and safety requirements and are not perceived as child-friendly. A further concern is that the spatial restrictions cannot support the number of children and are not conducive to exploratory pedagogic approaches. Minimal support was found for inclusive education, while the dire need for children from disadvantaged families was highlighted. Throughout the coding, it is evident how each participant provides their own experiences. The presentation of the data may seem to have included an abundance of direct quotations; however, without including the range of voices, the richness of the data would be lost, inherently limiting the notion of participation.

The severity of the impact of the COVID-19 pandemic was visible in all of the centres, with many having no children in August 2020. Similarly, the learning environment was drastically changed in terms of the physical, pedagogical, and social aspects. This raises a concern about how better to support the ECD sector during times of societal challenges in the future.

6.7 CONCLUSION

The findings presented in this chapter consisted of four datasets, each with a different qualitative analysis process. The **architectural survey,** as the first phase, formed the basis for the evaluation of the quality of the physical environments and also provided the background for the environmental quality evaluations, understanding of the class observations and mapping, as well as the interview analysis. The findings of the physical environmental analysis indicate the poor quality of the early childhood development learning environments at two of the low socio-economic sites and the adequate level of quality at three low socio-economic sites. The only low socio-economic site with good quality is site E6, which was designed and constructed through the interventions of an NGO. Both of the sites located in the high socio-economic context were considered to be of good quality, even though the evaluation still revealed some categories as not being ideal.

The **environmental quality** evaluations showed slightly different results, where the same low socio-economic site (E6) achieved an overall good rating along with both of the high socio-economic sites. The remaining low socio-economic sites all achieved an adequate rating. Notably, all these sites still included certain categories with a poor rating and others with a good rating. Similarly, the three sites that achieved a good overall rating still included aspects that were rated as adequate. Thus, the findings provide evidence of the negative impact of infrastructure that does not include the collaboration of architects and users and subsequently lacks responsiveness to the users' (children and adults) and to the geographic and climatic contexts. Furthermore, when relating these findings to the evaluation of the physical environment, the consequences of low standards for building materials and construction techniques are found to lead to lower-quality learning environments. Notably, the positive influence of the ECD principals and teachers towards overcoming the challenges to still provide the best possible learning environment is also found in most centres.

The **classroom observations** considered the activities, spaces, and environments at the time of the fieldwork across the different age groups towards evaluating the affordance for engagement, exploration, and active learning. The findings provided an insight into how children experience their environments, with the younger age groups being more active than the older age groups. Furthermore, the limitations towards affording exploration and engagement included a teacher-centred pedagogy, spatial constraints, and the impact of the COVID-19 pandemic's restrictions during 2020, when data collection occurred. Returning to the phenomenological lens, the limitations in developing the environment as a third teacher and a third space impact the potential for creating a place.

A deeper understanding of the development of each research site emerged through the **interviews (voice)** with the principals and teachers. The findings detail the challenges in achieving quality ECD learning environments posed by the contextual influences of socio-economic, policy, cultural, and geographic positions, among others. The impact of these contextual influences was found across the various ecological systems of the macro, meso, and micro spheres. The severity of the impact of the COVID-19 pandemic, which emerged in all of the datasets, was confirmed by the interview findings, represented in the chronosystem. The rich data from the range of voices

confirms the value of participatory processes in research, and the potential of collaborative design and construction is evident.

The findings, through the multi-layering of different forms of exploration, provide evidence of the inherent complexities of the learning environment microcosm. The evidence in the ecological contextual understanding illustrates the inequalities and limitations of early childhood development transformation in South Africa.

7. CHAPTER SEVEN DISCUSSION

7.1 INTRODUCTION

At the outset, my aim was to explore the relationship between responsive learning environments and early childhood development transformation in South Africa. This aim was explored through a review of literature, which considered the relationship between people and their environment in the context of learning environments broadly and then specifically for young children. The literature further considered the positioning of early childhood development as it relates to policy (global and local) and how this has played out in the democratic South African context. From the extensive literature reviewed, I developed theoretical lenses that included three distinct but related approaches: Firstly, the phenomenological lens that is presented through place, the third teacher, and the third space. Secondly, the contextualisation of early childhood development through the lens of ecological systems theory, its relatedness to the pattern language, and a proposed reconceptualised ecological model for early childhood development learning environments. Thirdly, the research was positioned through the rights-based lens of social and spatial justice.

The research methodology included a qualitative approach to the multiple-case study that followed a multi-method research design. The methodology used was drawn from research on learning environments and co-construction, as suggested by the concepts of the third teacher and the third space through the interpretative research paradigm, and combined with social and spatial justice through the transformative lens. The research findings are drawn from an evaluation of the physical environments, the environmental quality evaluations, the evaluation of the affordances offered to children, and the thematic analysis of the interviews with the participants from each site. The key findings provide evidence of the limitations and challenges to the quality of early childhood development learning environments that are more pronounced in a low socio-economic context. Using the women's views in the interviews, the challenges faced by these low socio-economic sites can be directly linked to the limitations of the South African early childhood development policy framework.

In this chapter, I present a synthesis of the findings from the different methodologies and discuss their relation to and relevance to the literature and theory. The findings are further considered in terms of the contribution of the research and its significance and implications in the context of learning environment research in South Africa.

7.2 SUMMARY OF THE KEY FINDINGS

The research argues that the government's lack of understanding and recognition of the role of the learning environment in their drive towards the transformation of early childhood development is a cause for hindrance rather than growth in the early childhood development sector. The evidence from the evaluation of the physical environments and the learning environment quality evaluations indicated that the low socio-economic sites' physical conditions include poor to adequate quality, while their learning environment quality was mostly found to be only adequate. In contrast, one of the sites in the low socio-economic context, which was recently upgraded with architecturally designed buildings and an outdoor play area, achieved a good rating for both the physical and learning environments, the same as the two high socio-economic sites.

Furthermore, the evidence from the classroom observations confirmed the impact of poor-quality physical and learning environments on the affordances for active learning. The potential for active learning was further limited through a teacher-centred pedagogic approach and the COVID-19 restrictions. The findings from the interviews indicated how the policy framework and funding model in South Africa impact the quality of early childhood development and its learning environments at a macro, meso, and micro level, limiting the agenda of early childhood development transformation. The timing of the research and data collection meant that the evidence illustrated the severity of the COVID-19 pandemic in the early childhood development sector and how the learning environments and day-to-day activities in the centres were altered.

The evidence from the interviews with women from eight early childhood development centres in the Outer-West region of eThekwini confirmed the critical concerns raised in the literature (Section 2.4). The 14 women interviewed voiced their lived experiences of being part of the early

childhood development sector in South Africa. The limitations observed in these centres were evidence of continued inequality in terms of the continued lack of spatial justice for disadvantaged communities and their continued lack of access to quality early childhood development. The study confirmed the reliance of the early childhood development sector on NGOs, faith-based organisations, and other donor organisations for continued support in their drive towards quality. The study further indicated the resilience of these women to overcome the challenges they face.

7.2.1 COMPARISON OF THE RESEARCH QUESTIONS AND FINDINGS

Returning to the framing of the research project through a set of research questions, Table 7-1 considers how the findings from the literature and the case study provide a response to each of the questions.

Table 7-1 Research Questions and Findings

Research Questions	**Research Findings**
1. What is the relationship between ECD transformation and ECD learning environments?	- Through the literature review that explored the relationship between people and their environment, the research found a **complex interrelated connectedness** that impacts directly on learning and child development as explored in Sections 2.2., 2.3, and 2.4. - The findings from the case study interviews provided evidence of how the **challenges to the learning environment impact on the potential for providing quality ECD** (Chapter 6, Section 6.6).
2. What is the relationship between the quality of the ECD and the quality of the ECD learning environments?	- The literature confirmed that the potential for quality learning and child development is **strongly related** to the quality of the physical, social, and pedagogic environment (Chapter 2, Sections 2.2 and 2.3). - The determinants of quality ECD were found to include distinct approaches **to pedagogy** (active learning), **the physical characteristics** (child centredness) **and ownership** (belonging) (Chapter 2, Section 2.3).

	- The case study findings **confirmed that low-quality learning environments impact** on the potential for engagement and exploration by the children as explored in (Chapter 6, Section 6.5). - The findings from the case study interviews confirmed teachers' experiences of the **impact of poor-quality learning environments on the day-to-day activities** of the children (Chapter 6, Section 6.6).
3. What is the status of ECD transformation in post-Apartheid South Africa in the context of local and global development goals?	- Through the review of literature, the research found **severe challenges leading to a continuation of inequalities** in terms of access to quality ECD in South Africa (Chapter 2, Section 2.4.2). - The case study findings confirmed the **inequality** with evidence of poor and inadequate quality found in relation to the physical and holistic environmental evaluations (Chapter 6, Sections 6.3 and 6.4). - The classroom observation component of the multiple-case study further confirmed the **limitations of inequality** on the potential affordances of activities, spaces and environments created (Chapter 6, Section 6.5). - The findings from the interviews provided details of the challenges faced by the ECD centres in terms of providing quality ECD and LE (Chapter 6, Section 6.6). These challenges can be directly related to the **policy framework,** confirming the issues raised in the literature (Chapter 2, Section 2.4.2).
4. What are the range and qualities of the ECD learning environments in two diverse socio-economic communities in the Durban metropolitan area of South Africa?	- The findings from the case study confirmed the inherent **inequalities** in the learning environments, where low socio-economic sites have lower quality environments as compared to high socio-economic sites (Chapter 6, Sections 6.3 and 6.4). - The findings provided detailed evidence of the **limitations in terms of the quality of the learning environments, found primarily in the low socio-economic sites**. The only site from the disadvantaged area that was found to have good quality physical environments is the result of an NGO intervention that included an architectural design with participatory processes. The two high socio-economic sites presented overall good quality physical environments (Chapter 6, Sections 6.3 and 6.4).

	- The findings from the holistic environmental evaluation presented evidence that includes poor ratings in some criteria, but an overall rating of adequate for five of the low socio-economic sites. The good quality found at the newly designed low socio-economic site and the high socio-economic sites confirm the positive impact of good physical environments towards holistic quality (Chapter 6, Sections 6.3).
5. How do the selected ECD centres' occupants (children and adults) experience their learning environments?	- The environmental observations evaluation provided evidence of how children experience their learning environment, with the findings showing a **relationship between poor quality physical spaces and limitations in the affordances provided** (Chapter 6, Sections 6.5). - The evidence further found how a **teacher-centred approach negated the potential afforded by the spaces** (Chapter 6, Sections 6.5). - The **impact of the COVID-19 pandemic** restrictions was found to limit the provision of quality learning environments and limited active learning due to the physical restrictions on the use of the spaces and movement (Chapter 6, Sections 6.5). - The interviews provided rich data which inherently confirmed the value of participatory processes and the **potential of collaboration** (Chapter 6, Sections 6.5). - The interview findings showed that the principals and teachers are **knowledgeable about the value of quality learning environments** (Chapter 6, Sections 6.5). - The experiences of the principals and teachers confirmed the limitations on quality posed by poor quality environments (Chapter 6, Sections 6.5). - The principals confirmed the numerous challenges posed by the limitation of the **policy** in relation to registration and funding (Chapter 6, Sections 6.5).
6. How does the South African policy framework impact the quality of ECD learning environments?	- The literature review found that the **policy framework and funding model** pose several challenges that are impacting on the quality of the ECD learning environments as explored in (Chapter2, Section 2.4).

	- The lived experiences of the principals and teachers confirmed the limitations posed by the **policy framework and funding model** in their desire to provide quality learning environments (Chapter 6, Sections 6.5). - The findings suggested that the ECD sector is hanging in the balance due to its **dependency on donations and NGO/faith-based support** in lieu of government support to continue their work. (Chapter 6, Sections 6.5).

Source: Author (2024)

7.3 INTERPRETATION OF THE FINDINGS

Considering the range of findings across the various research questions, it is critical to elaborate further on their meaning and value. Thus, the following section considers the findings as presented in Table 7-1 in more detail and in relation to the literature, methodology, and research questions. The theoretical lens of the ecological systems theory (Bronfenbrenner, 1979) will be used as a broad overall framework to consider how the findings relate to the various contextual systems—the macro, meso, and micro (space and place) systems and the chronosystem. Here, the microsystem represents the conceptualisation of the early childhood development learning environment as the third teacher, third space, and place that formed the basis of the environmental quality evaluations and observations. The lens of social and spatial justice is considered throughout the discussion, as the findings bring to light the levels of inequality experienced and the inherent discrimination of not providing equal access to responsive learning environments.

7.3.1 CHALLENGES AND INEQUALITIES IN THE ECD LEARNING ENVIRONMENTS

The research found several challenges leading to a continuation of inequalities in terms of access to quality early childhood development in South Africa. The key aspects that impact early childhood development transformation, found in the reports and review papers discussed in Chapter Two, Section 2.4.2, include enrolment numbers, teacher training, government funding, the early childhood development programmes, the condition of the infrastructure, the registration status of the early childhood development centres, and the COVID-19 pandemic

(UNESCO International Bureau of Education, 2006; Biersteker, 2008; Atmore *et al*., 2012a; Ashley-Cooper *et al.*, 2019). The interviews with the principals and teachers of the low socio-economic early learning sites confirmed the challenges and provided details of how they impact the quality of their lived experiences.

The theme of early childhood development in the macro context speaks directly to the transformational challenges that include how children are positioned in their social, cultural, and political contexts. One of the teachers reflected on the limitations inherent in the quality of early childhood development programme as some early childhood development centres were actually just set up as childcare facilities. The staff in those facilities were not trained and equipped to provide quality early childhood development and the parents did not consider their children's development. Instead, they were only concerned about a safe place for their children to be cared for while they were at work. The differences between quality early childhood development provision and childcare have been raised in international research (Boyden *et al.*, 2019a) as they impact directly on the potential of early investment in children's development (Heckman, 2016). A formal early childhood development programme facilitates development, whereas simple childcare does not. Thus, when viewing the national integrated early childhood development plan (Department of Social Development, 2015) that was developed to invest in childhood development at an early stage, through its primary aim of providing equal access to quality holistic early childhood development, the findings indicate that this target has yet to be achieved (Atmore *et al.*, 2012a; Ashley-Cooper *et al.*, 2019). In relation to equal access to quality, one of the concerns raised in both the literature and the multiple-case study refers to the enrolment numbers exceeding the space available, leading to crowding in the classrooms. According to the participants, the factors influencing crowding often include combining groups of children when centres take in more children to increase the fees or grants that this generates. Crowding is a micro-contextual concern in terms of spatial arrangements and teacher-to-child ratios, and the challenges encountered are rooted in a combination of funding limitations and the positioning of children in society. Atmore (2018) argues that early childhood has been disadvantaged since the start of democracy, as early childhood development was only introduced as part of the education transformation agenda several years after the other sectors were reformed. White Paper 5 (DoE,

2001) placed the early childhood development sector on the backfoot. The neglect of this sector perpetuates the lack of funding for ECD infrastructure, limited enrolment of children, and the lack of staff training, among other aspects, showing that these macro-contextual issues result in continued social injustice (Atmore, 2023).

One of the critical determinants of quality early intervention is having educators who are knowledgeable about early childhood development and equipped to provide it properly following training and formal education. According to Biersteker (2008); and Biersteker *et al*. (2016), a major concern is the limited government funding provided for education and training, compounded by the poor conditions of service in the sector (low salaries, etc.). The multiple-case study indicated that training support is primarily provided by NGO intervention. The women from the low socio-economic sites expressed immense appreciation for the opportunity to study and found value in what they learned and how it impacted their teaching. The principals of the early childhood development centres accessed understand the impact of qualified staff and are actively seeking teachers with training and experience. However, these qualified teachers are hard to find and keep due to the limited job security and low salaries inherent in the early childhood development sector (Biersteker, 2008).

The concern with the lack of government funding and the onerous requirements for registration extends the macro-contextual influence towards spatial inequality. The level of inequality presented in the findings was confirmed by the poor condition of the infrastructure during the physical and holistic environmental evaluations of the low socio-economic sites. The limited research investigating the physical environments of the early childhood development centres in South Africa has found major challenges in the registered centres and even greater challenges in the unregistered centres (Sotuku *et al*., 2016; Madyibi and Bayat, 2021; Nelly and Matjokana, 2023). The registration status of an early childhood development centre is directly related to the quality of the physical environment in it, and one of the principals (Principal 3) elaborated on her frustrating journey to meet the registration requirements. This frustration was shared by almost all of the low socio-economic sites, as the staff explained that access to funding depended on their centres being registered as early childhood development centres, which, in turn, depended on them meeting the minimum standards. These findings concur with the literature reporting

poor quality infrastructure (Atmore *et al*., 2012a; Ashley-Cooper *et al*., 2019; Hall *et al*., 2019) and confirm that the conditions for access to funding are very restrictive and demanding. Thus, the findings regarding early childhood development at the macro-contextual level (Bronfenbrenner, 1979) suggest that the level of early childhood development transformation observed thus far in post-Apartheid South Africa does not meet the targets set out in the local and global development goals.

Our understanding of the extent of the inequality was furthered by a more detailed view of the classroom observation component of the multiple-case study, which captured the experiences of the children and their teachers in their space. The analysis and evaluations illustrated that sites with poor quality environments impact negatively on the potential affordances of activities, spaces, and environments to promote childhood development. The photograph (Fig. 7-1) taken at a low socio-economic site during the classroom observations shows the crowding that occurred when two age groups were combined. Notably, this was during the COVID-19 period, when each child was assigned to a chair for the day and limited to passive engagement with their environment.

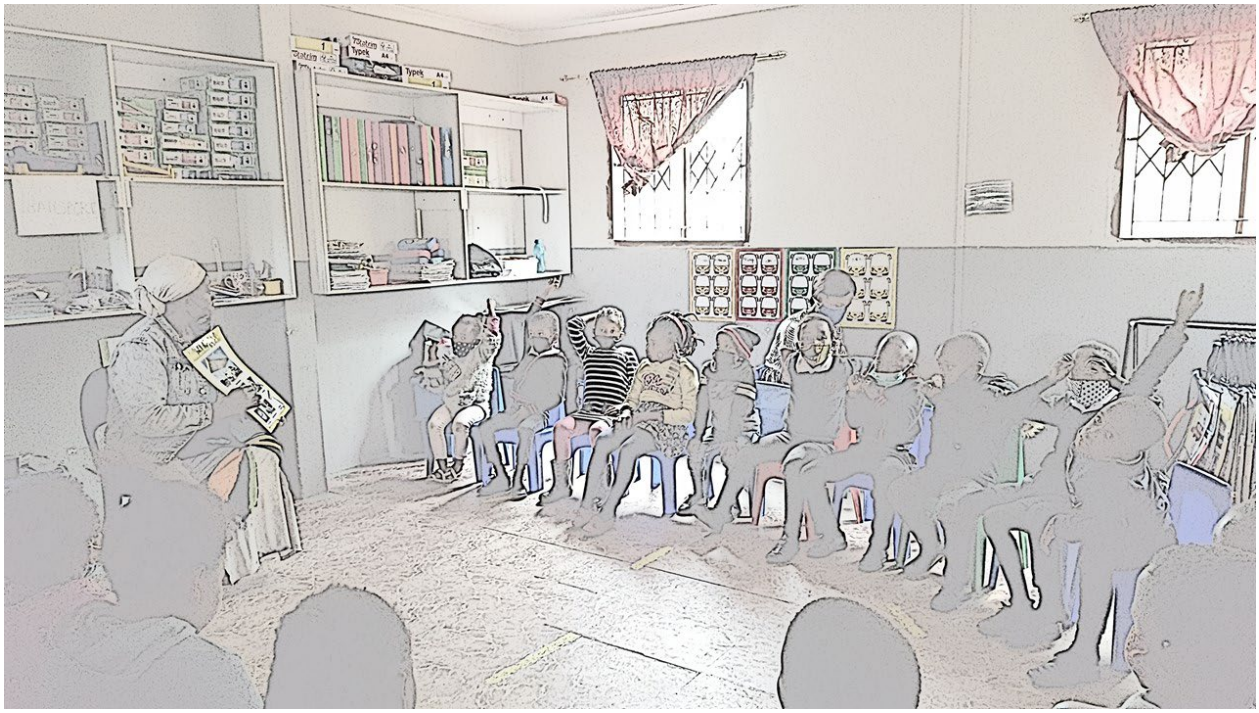


Figure 7-1 Passive Engagement and Crowding Caused by Limited the Floor Area Ratio

Source: Author (2020)

In contrast, the availability of space at one of the high socio-economic sites, seen in Fig. 7-2, allowed for active exploration due to the availability of space for different learning areas. A closer analysis of the two spaces showed several differences in the quality characteristics at the micro-contextual level that explained the poor holistic environmental quality rating in the site above compared to the good rating in the other site below in Fig. 7-2.

Figure 7-2 Active engagement achieved through spatial qualities

Source: Author (2020)

The holistic environmental evaluation (Lippman, 2010b; Barrett *et al*., 2015) showed more variances in terms of the good quality of the outdoor play areas, and the sense of place was mediated by the poor quality of the infrastructure. The findings showed that none of the E1-5 sites had a poor overall rating, even though there were some criteria that were poor. In parallel, the interviews confirmed that the principals and teachers all valued the environment and raised concerns when quality was limited. The teachers valued outdoor play and recognised the need for appropriate equipment, thus demonstrating an understanding of the relationship between people and their environment and how the quality of the environment influences children's development.

The impact of the architectural design of a responsive learning environment was found in the transformation of site E6 and captured by the reflection of one of the teachers (teacher 7). She first explained the challenging situation posed by the original building, as all the children were housed in one space, and approved of the use of repurposed shipping containers to construct the new school, as they greatly improved the learning environment. When asked how the children responded to their new school, she shared how excited they were about the child-sized toilets, confirming the importance of child-scale facilities and equipment. A comfortable environment customised to the child's scale is considered very important in architectural design for children (Day and Midbjer, 2007).

Figure 7-3 Site E6 Showing the New Child-Centred Environment

Source: Author (2020)

In contrast, an intervention by a corporate company at site E5 provided several improvements. However, on reflection, not all the decisions are suitable. The shortcomings can be attributed to working without participatory approaches and architectural/technical guidance, as the changes tend to be cosmetic and not necessarily appropriate for an early childhood development learning environment. In particular, the environmental quality evaluation measured during the fieldwork in November 2020 showed that the building performed poorly during extreme temperatures, as

the internal temperature was 30.5° Celsius. The interventions included the installation of a new ceiling, without the provision of thermal insulation, thus, the issues inherent to the building's materials and construction were not addressed. The principal was very excited about the involvement of the donors in the refurbishment of the centre, as they willingly provided what she asked for. However, she also reflected on the limitations of the decisions that were made, such as the fitting of carpets in all the spaces, as this met with disapproval from the social worker who subsequently inspected the centre. The social worker informed them that they should have tiled the floors instead.

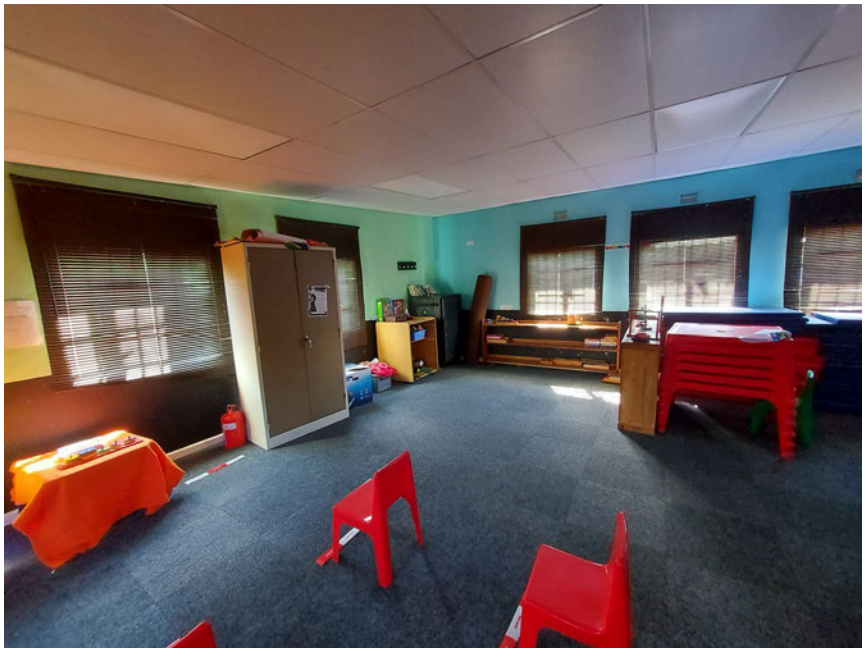


Figure 7-4 Site E5 Primarily Cosmetic Intervention

Source: Author (2020)

When considering these meso level relationships with NGOs, faith-based organisations, and corporate companies that the centres build and rely on for various forms of support, some concerns emerge. The findings suggest that the ECD sector is hanging in the balance due to its dependency on donations and support, in lieu of proper government support, to continue its work. It also emerged that there is a need for a resource or design guideline to inform the interventions and construction of new ECD centres. A mechanism such as this will provide a support network, and the government will be equipped to make informed decisions in

partnership with the ECD providers to ensure appropriate application of funds towards establishing responsive ECD learning environments.

A clear understanding of the value of responsive learning environments was found by rooting the study in the discourse on the environment and behaviour, which extends into environmental psychology and learning environment research. Critical to how this relationship manifests when considering early childhood development is including the multiplicity of the environment where the physical, social, and pedagogic aspects become intertwined, as presented in the conceptual framing of the third teacher, third space, and place. The interplay between these dimensions, explored in the studies of Clark (2007); Barrett *et al*. (2019); and Matthews and Lippman (2020), brings together methodological and design approaches that acknowledge the holistic nature of quality environments. The critical nature of the impact of the environment on children's development is confirmed in the literature that discusses the assessment of quality in relation to children's environments. In fact, research is often motivated by the lack of recognition of the value of quality in learning environments in contributing to the overall quality of care and education, more so in the developing world (Abbas, 2012; Bernard, 2012; Barrett *et al*., 2019). There are three key determinants of quality early childhood development: staff that are equipped through education and training; age-appropriate equipment and curriculum; and a safe and stimulating learning space. Thus, the interactions between people and the pedagogic and physical environments are included in what constitutes quality early childhood development that enables the potential for transformation. Arndt (2012) extended the potential for transformation to include a biological and neurobiological impact on a child's growth and warned of the consequences of poor-quality early childhood development.

The severity of growing up in poverty, as presented by Bendini and Devercelli (2022) and in the studies more specific to the context of South Africa by Munongi and Pillay (2018), were echoed in the interviews. One participant reflected passionately on her journey from not knowing what early childhood development was to seeing a well-established centre in a high socio-economic area, stating that it inspired her to make a difference in her community. She reflected on the area, the disadvantaged backgrounds and homes that the children come from, and how her early childhood development centre presents a better second home, so to speak. Her reflection

provided us with a glimpse of the need for learning environments to serve as places of belonging, along with the critical role that educators play in building relationships. The insight provided more depth to the inherent consequences of poverty, which leads to stunting of growth, stress, and lack of stimulation, all causing developmental delays (Engle *et al*., 2007; Boyden *et al.*, 2019b). However, when comparing the learning environment evaluations for the centre (E1) that this principal represented, it is concerning that the overall ratings were poor (physical) and adequate (holistic). The details of the evaluations show that all the physical environment criteria were rated as poor, causing the criteria of naturalness and stimulation to be poor. The urgency and sense of frustration of the principal are understandable, as there is a need to seek ways to serve the community constantly, and, in doing so, she is accommodating more children than the physical spaces allow for while already faced with limitations of funding and buildings and outdoor areas that need repairs.

At the micro-contextual level, a deeper understanding of the severity of the physical conditions that constitute the rating of poor is needed. A noticeable concern is the steep sloping site, causing a severe limitation on the outdoor play area, as seen in Figs. 7-5 and 7-6, where only a small level area is available for the younger children to play on. The lower area of the site and the timber classroom in the background are used for the foundation phase students (ages 6-9). They need to access the ablutions by walking through a classroom for the younger groups. The play area shows severe neglect, with various attempts to contain the soil from eroding further. In contrast, the quality of the large, well-developed outdoor play area found at a high socio-economic site was rated as good, as seen in Fig. 7-7. The contrast between the experiences offered at these two different sites emphasises that inequalities persist.

Figure 7-5 Limitations of the Steep Sloping Site Impacting Health, Safety, and Navigation

Source: Author (2020)

Figure 7-6 Poor Condition of the Outdoor Play Area

Source: Author (2020)

Figure 7-7 Well Developed Outdoor Play Area

Source: Author (2020)

Consideration is needed for how the macro challenges to the ECD sector become evident when relating the micro space/place themes (Chapter Six, Sections 6.6.4 and 6.6.5) to the learning environment evaluations and their potential quality. The interview findings support the evaluation criteria of naturalness, stimulation, and place in relation to the role of colour, display, noise, temperature, light, spatial arrangement, age-appropriate equipment, and nature as determinants that influence the appropriateness for early childhood development, echoing the learning environment research by Clark (2010a); Barrett (*et al*., 2015); Matthews and Lippman (2020); and Adlerstein and Cortazar (2022). Notably, these approaches all rely on participation in line with a rights-based approach to architecture and learning environment research, confirming the value of overlaying the evaluations with participants' experiences.

Furthermore, through the overlaying of the classroom observations with the physical and environmental evaluations, the findings confirmed how lower-quality learning environments impact the children's potential for engagement and exploration, as explored in Chapter Six (Section 6.5). This aligns with the argument presented by Barrett *et al*. (2019); and Matthews and Lippman (2020), that learning environments need to create a sense of place, provide health and safety, have an optimal design, foster pedagogy and a sense of community, and enable flexibility (sustainability), as discussed in Section 2.3.1. Although no direct interaction with children was

included in the study, the classroom observations and evaluations provided evidence of how children experienced their learning environment. The finding showed a relationship between the quality of the environment and the affordances provided, as explored in Chapter Six (Section 6.5). The findings, therefore, further confirmed the need for a qualitative evaluation methodology that provided a holistic understanding to capture the complexity of early childhood development, as discussed in Chapter Four. The application of the holistic evaluation method, adapted from Barrett *et al.*'s (2015) clever classrooms approach and combined with the methodology from Lippman (2010b) for responsive learning environments (see Section 4.4), indicated that established learning environment research approaches from a developed world can be applied effectively to the South African context. Thus, the gap in learning environment research in developing countries can be addressed by using these approaches.

Furthermore, the detailed discussion with the participants provided deeper insight into the impact of poor-quality learning environments on the day-to-day activities of the children (explored in Section 6.6). These participatory approaches are in line with the research approach and the interpretivist/transformative paradigm and support the notion of giving a voice to marginalised groups, as discussed in Chapter Four (Sections 4.2 and 4.4). The women's reflections from the interviews also showed determination to continue finding solutions to the problems, such as by overcoming the limitations of the shared space by obtaining partitions or by dealing with extreme temperatures with the use of a fan or switching the lights off to cool the spaces. The evidence also confirmed the limitations inherent in the low socio-economic early childhood development centres found in other parts of the country, according to Sotuku *et al*. (2016); Madyibi and Bayat (2021); and Nelly and Matjokana (2023). However, these studies followed simpler evaluation methods of the physical infrastructure rather than the complex holistic evaluation of my research. The difference between these approaches is found in my gaining a deeper understanding of how the poor quality of the buildings was experienced and how the physical characteristics influenced behaviour. Furthermore, the holistic evaluations showed that some of the poor physical characteristics could be mediated by the way in which the environment was created as the third teacher, with elements of colour, the displaying of children's artwork, and so forth. On the other hand, the spatial characteristics could contribute, in some instances,

to how a teacher-centred approach negated the potential afforded by the spaces, as explored in Chapter Six, Section 6.5., limiting the potential of the place and third space.

The detailed presentation of the findings in Chapter Six effectively shows the very broad range of building forms, the number and composition of the class groups, and the relationships with their community that could contribute to early childhood centres in most regions of the country. In South Africa, it is only through the recent ECD census (Department of Basic Education, 2022b) that statistics on the status of the ECD sector have become available. However, the census still leaves gaps in terms of the detailed documentation of what constitutes each ECD centre that could be counted. Therefore, the depth provided by this collective case study can be acknowledged as supporting the furthering of ECD research broadly and, specifically, setting a precedent for an architectural approach to understanding the range and quality of ECD centres. This notion of a detailed analysis is supported by Adlerstein and Cortazar (2022) in their phased approach, which regarded a situational analysis as critical to improving the quality of early childhood development in developing countries (as discussed in Section 2.4.1). Here, we acknowledge that the position of the learning environment must be central in any efforts towards transformation.

The value of the research becomes evident when we consider the severe challenges posed by the policy framework and funding model and how the lived experiences of the principals and teachers (presented in Section 6.5) confirmed the literature findings of them having a direct impact on the quality of early childhood development (see Section 2.4). Hence, to move forward and initiate change, a detailed situational analysis, like the one tested in this study, is required on a scale that will enable the use of a phased approach (Adlerstein and Cortazar, 2022). Step two of the process will need to include a reflection of the challenges and will only be able to be completed with a more nuanced understanding of how the challenges impact early childhood development and its learning environments across the full range of contexts in South Africa. However, a further concern was the contrast between how the norms and standards define quality, as seen in the literature presented in Chapter Two. Notably, Adlerstein and Cortazar (2022) highlighted the same concern as being predominant in most developing nations, suggesting that a more holistic evaluation method is needed, as well as the development of guidelines to inform the

improvement and development of early childhood development facilities through participatory processes. It is therefore pertinent to include such a framework or guideline as part of my research recommendations, as a response to the research aims set out in Chapter One.

The impact of the COVID-19 pandemic, including the closure and delayed reopening of schools and the restrictions relating to hygiene and social distancing, on the ECD sector did not form part of the original conception of the research problem. It was merely coincidental that the timing of my research and fieldwork coincided with this global disruption of life, with evidence from the literature suggesting the already vulnerable sector was left hanging with minimal government support and interventions (Wills *et al.*, 2021; Fredman *et al.*, 2022; O'Keeffe *et al*., 2022). During the environmental evaluation, the classroom observations and the interviews showed how the restrictions limited the provision of quality learning environments and limited active learning through the physical restrictions on space and movement, as explored in Section 6.5. My observations agree with the severity of the changes that occurred between visiting the centres in 2019 and the start of the data collection in August 2020. The limiting impact of the pandemic's restrictions on active learning and exploration is worth considering further (see Section 6.5). In the high socio-economic sites, some sense of a child-centred environment and active pedagogy was still evident. However, in most of the low socio-economic sites, the children were allocated to a chair at the start of the day, meaning they were mostly seated on chairs throughout the day, either in a circle or at a table. Inadvertently, the constraint became more visible in the older age groups, where children would obey the instructions from their teacher. This was perceived as being a teacher-centred environment. The younger age groups showed more freedom of movement as they simply moved with their chairs, confirming the more natural tendency for active learning. The literature identified the differences in engagement and how children's development is improved when the design of the learning environments is age appropriate (Day and Midbjer, 2007; Crosnoe *et al*., 2010; Matthews and Lippman, 2020). Notably, where children were observed during outdoor play time, the freedom of being outdoors facilitated a more natural, child-centred exploration.

The notion of the outdoors as a free space was discussed in Sections 2.2 and 2.3, with research supporting the critical role of outdoor play and contact with nature (Harte, 2013; Deaver and

Wright, 2018; Berti *et al*., 2019). Although these findings are limited to the scope of a small multi-case study with observations made over a short period of time, they showcase the relationship between the physical space, how it is created to be a learning environment, and the pedagogic approach. The role of the outdoors is furthered by the evaluation of the spatial characteristics that support the connection between the inside and outside, as well as the views over nature (Lippman, 2010b; Barrett *et al.*, 2015). However, in contrast to the notion of a flow from the inside to the outside environment, the case study indicated how all the centres prefer to separate the indoor activities from the outdoor activities, both physically and with scheduled time. Teachers commented on how being able to see outside causes distractions. This finding contrasts with pedagogic approaches where free movement is enabled; however, it aligns with the literature that adults view nature and adverse weather as a risk, which leads to controlling children's access to nature (Ernst and Tornabene, 2012; Ernst, 2014; Fruin, 2020).

The discussion of the findings extracted key aspects from the data to highlight the range of influences on the transformation of early childhood development and how this plays out in the evaluation of the learning environments in the case study. The deeper engagement with the findings illustrates the complexity of the problem and the possibilities for addressing it. The body of work presented in Chapter Six goes beyond just answering the research questions and, therefore, suggests that further analysis could be included in future research endeavours.

7.3.2 SIGNIFICANCE AND IMPLICATIONS OF THE STUDY

When reflecting on the significance and implications of my research project through literature, policy, methodology, and theory, the findings that emerged were meaningful and timely. The precarious position of the early childhood development sector in South Africa has been raised as a concern for some time. However, the implications of the COVID-19 pandemic (Koen *et al*., 2021; Wills *et al*., 2021) and how it was handled by government departments increased the challenges experienced by the sector, to the point where the inherent discrimination (Fredman *et al.*, 2022) that is suffered due to the continuation of inequality in early childhood development and its learning environments was easily identified by various scholars. My study aligns with and extends the recent ECD census (Department of Basic Education, 2022b) and the Thrive by Five (2022)

study, which formed part of the transition of the early childhood development sector to the Department of Education. From an international perspective, my approach and research design follow the principles that are established as good practice in learning environment research (Barrett *et al.*, 2019; Matthews and Lippman, 2020), as well as the phased approach proposed to assist developing nations in their early childhood development transformation processes (Adlerstein and Cortazar, 2022). The application of these approaches in the context of South Africa not only contributes towards addressing the gap in learning environment research, but it has also developed (adapted) and tested a methodology to evaluate early childhood development learning environments of a diverse nature while speaking directly to the limitations of the policy framework.

Fig. 7-8 highlights the main challenges found when relating the findings more directly to the objectives of the integrated development plan to provide learning environments that consider health and safety and provide equal access and quality. The diagram illustrates how the notion of quality is negated by registration and funding limitations, which indirectly negate the rights of children to the potential of holistic child development. (The dashed lines show the broken relationships between the policy ideals, implementation of the policy, and rights.)

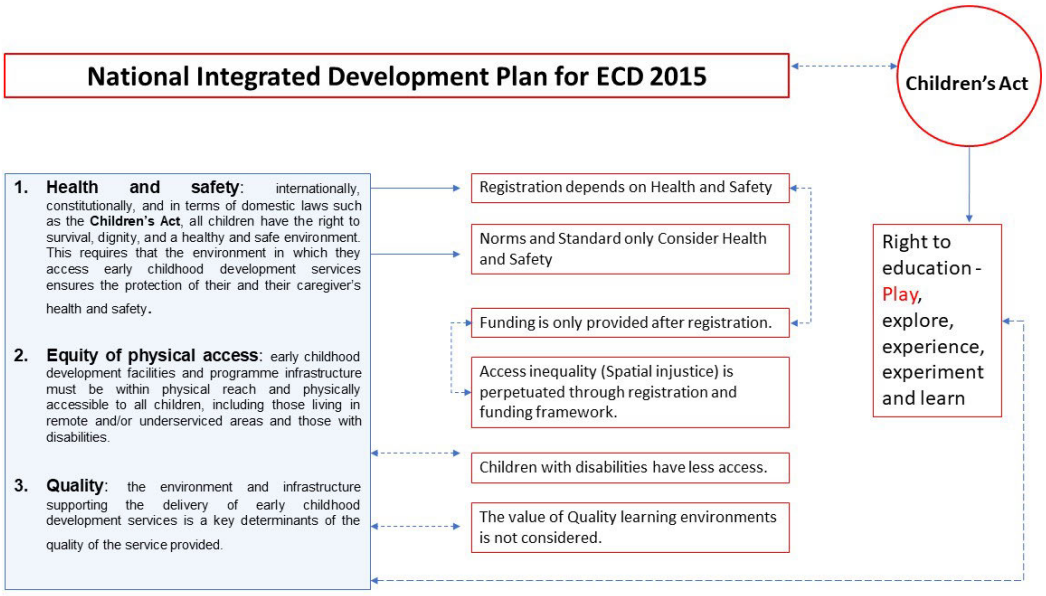


Figure 7-8 Findings on the Impact of the Policy in Achieving Children's Rights

Source: Author (2024)

One of the implications of my research is the need to develop a framework or design a guideline that can support a better understanding of the value of responsive early childhood development learning environments that could be applied when developing existing infrastructure. The most pertinent implication of my research is the call for a review of the positioning of the learning environment within the policy framework. Such a review will consider the registration requirements and funding model for early childhood development centres, and establish participatory processes and collaboration between the government, early childhood development providers, and NGOs using the proposed framework and design guidelines for improving quality.

Returning to the principles of early investment in children's development (Section 1.1) as a key motivation for my research, the significance of the research extends to acknowledge how the current early childhood development systems, which perpetuate inequality, are failing the most vulnerable communities. Furthermore, the rights of all children in South Africa are not being supported because of the inherent inequality of early childhood development and their learning environments, placing an urgency on the need for change that could also align with the Sustainable Development Goals, particularly SDG 4.2, that addresses early learning.

7.4 RELATION TO THE THEORIES AND MODELS

At the outset, my research was positioned in the phenomenological paradigm due to the experiential nature of exploring the relationship between people and the environment. In the literature explored (Sections 2.2 and 2.3), the critical role of the environment as a complex system was confirmed, with the concepts of place, third teacher, and third space being particularly relevant to understanding learning environments. Throughout my writing of the research report, these concepts have become intertwined as a multi-dimensional system of the early childhood development learning environment, moving beyond a mere lens of understanding. This is evident in the research design (Sections 4.3 and 4.4) and the environmental evaluations (Section 6.4) and observations (Section 6.5), where the concepts framed the understanding and confirmed the scholarly discourse discussed in Chapter Three, Section 3.2. The conceptual system, illustrated in

Fig. 7-9, maps the way that the components of quality learning environments overlap with each other through the concepts of the place (belonging), the third teacher (pedagogy), and the third space (participation). In the environmental evaluations (Section 6.5), the concepts are still separated, but a deeper consideration shows how intertwined these elements are. Thus, my application of the phenomenological theoretical approach (Section 3.2) for early childhood development learning environments provides a new conceptual model that is loosely based on the spatial triad of Lefebvre (1991); Bhabha (1994); and Soja (1996), while recognising the meaning inherent in place, the silent lessons of space, and hinting at the notion of spatial justice (Section 3.4) when considering the social production of the environment.

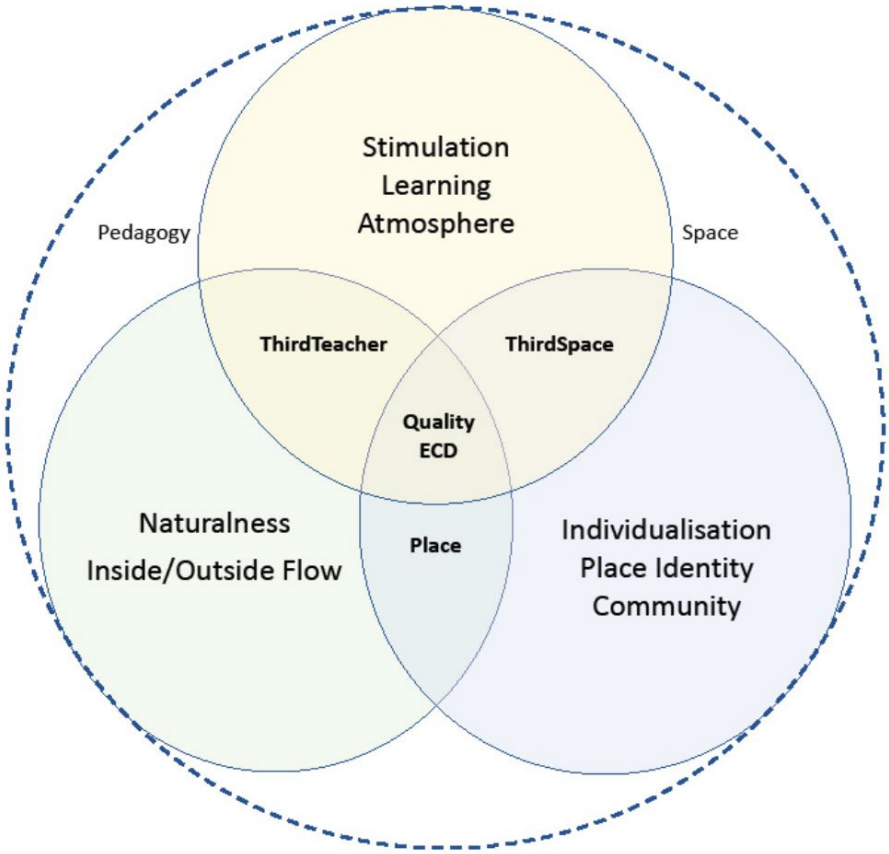


Figure 7-9 Conceptual System of the ECD Learning Environment

Source: Author (2024R)

However, when positioning my research within the discourse of early childhood development, a broader understanding of the relationship between a child and his/her environment is found

using the ecological systems theory (Bronfenbrenner, 1979) (discussed in Section 3.3). Although this framing of the contextual influences on child development is not new, my approach furthers the model and extends the interconnected system into architectural discourse by incorporating pattern language (Sections 2.3.3 and 3.3.2). The principle of using pattern language to capture reoccurring problems became part of the analytical framing (Section 6.4) of the environmental analysis and will be extended into the recommendation towards the structuring of the proposed design guidelines (Section 8.4.3). The application of the pattern language as an analytical tool starts the process of connecting the early child development learning environment's conceptual system (Fig. 7-9) to the nested ecological model. However, in Chapter Three, Section 3.3.3, I argued for the reconceptualisation of the nested system to view the contextual influences from the perspective of the ECD learning environment as a microcosm. Therefore, the ECD learning environment, in all its complexity, as viewed from a phenomenological worldview, becomes predominant. My graphic representation in Fig. 7-10 of the overlaying of the ECD LE conceptual system (as a microsystem) with the ECD Learning Environment ecological model captures how the various influences impact the quality of the learning environment. The findings from the interviews, which were presented through the ecological themes of the macro, meso, micro space/place, and the chronosystem (Section 6.6), provide evidence of how each of the broader system challenges trickle down into the microsystem. The modelling further provides a lens that brings the rights-based perspective of placing the focus on the children and the ECD centre women, as opposed to the original modelling from an external view—discussed in Chapter Three, Section 3.3.3. The original model with the nested, perfectly shaped circles contradicts the reality of how the influences are context-dependent and varied, rather than equal and well balanced.

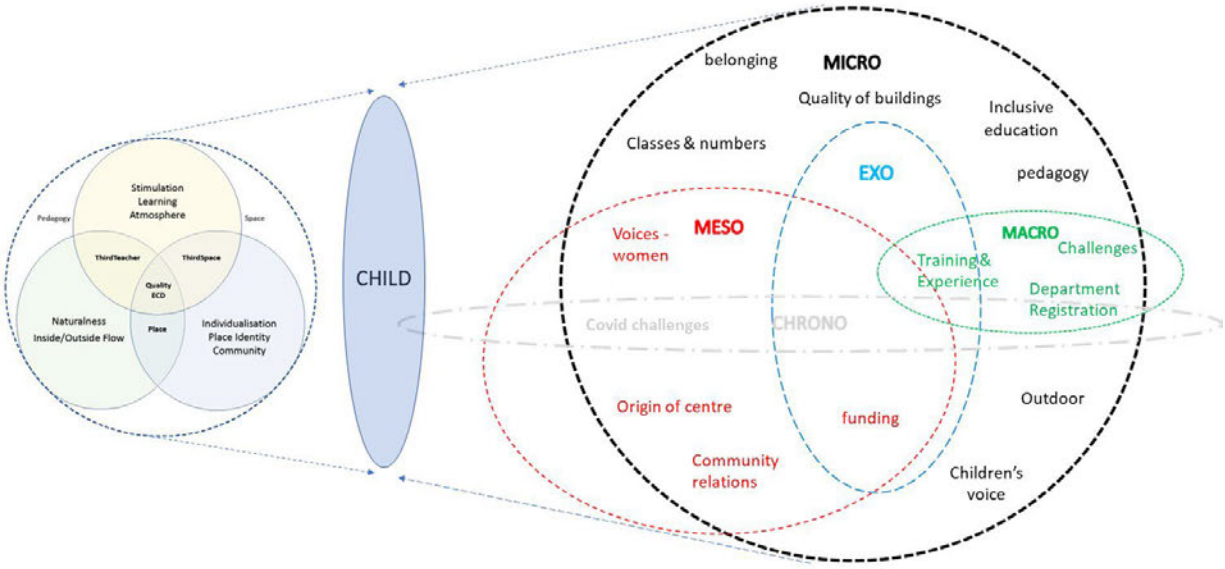


Figure 7-10 Complexity of the ECD Learning Environment Microsystem and Ecological Model

Source: Author (2024)

Fig. 7-10 shows the complexity of the ECD learning environment microsystem and the ECD learning environment ecological model for this multi-case study and how these impact children. Both systems need to work together towards achieving quality early child development learning environments for all children, irrespective of their socio-economic status.

However, the third theoretical lens of social and spatial justice (Section. 3.4) is applied to contextualise both the phenomenological conceptual approach and the ecological model in terms of a developing nation and its related inequality. The evidence from the literature (Sections 2.4.2 and 2.4.3) and the multiple-case study (Chapter Six) found that the inequality among the disadvantaged and vulnerable communities in South Africa is ongoing. The lens of social justice is often applied to research within the context of Africa; however, the application of spatial justice to capture the environmental dimension of inequality is less common in the literature relating to early childhood development. My approach to social and spatial justice is rooted in the theoretical framing (Section 3.4) and in the research paradigm (Section 4.2), which shifted during the research journey to include the transformative paradigm. This shift was the direct consequence of my engagement with the participants in recognition of their plight to improve their conditions (Section 6.6). The concepts of the third space and the third teacher consider

participatory processes as critical to the development and experiences of the early childhood development learning environment. From an architectural perspective, application of the pattern language as a methodology requires a participatory response and supports the notion of the social production of space. Thus, in my research, the need for spatial justice was first found in acknowledging the diversity of the ECD learning environments that lead to inequality, and second, in how the policy framework and funding model were found to extend the inequalities in the sector. The need was also apparent in the top-down approach inherent in the development of the ECD sector, where decisions are made by government departments (at the macro and meso levels—Section 6.6), with limited understanding of how these decisions impact the lived experiences of the ECD providers, the teachers, and the children. I therefore argue that spatial justice could be achieved for the ECD sector by using a participatory approach to reviewing ECD policies, similar to what Soja (2010) proposed to address urban inequalities.

My theoretical and conceptual contribution can be considered to show the application and extension of the existing concepts and models. My application within the context of the ECD learning environment goes beyond the existing approaches in an attempt to acknowledge its multi-dimensional complexities. Thus, the findings provide a nuanced response to the primary research question: What is the relationship between responsive learning environments and early childhood development policy transformation in South Africa?

7.5 CONCLUSION

The chapter provided the key arguments of my research by providing a synthesis of the various components of the literature, theories, and concepts in relation to the methodology and the multiple-case study findings. A synopsis of the key findings in relation to the research questions gave an overview of the outcome of the research. A more detailed discussion explored and interpreted the empirical findings in relation to the literature, with selections from the fieldwork to illustrate the arguments relating back to the research problem better. The inequality and limitations impeding the transformation of early childhood development and the ECD learning environments were evident.

The theoretical and conceptual framing and the methodological approach suggested the potential for transformation in the ECD sector. This transformation requires participatory processes towards investigating the current status of the ECD learning environments, as well as a review of the policy framework and funding mechanism. The need to develop design guidelines to facilitate the improvement and development of responsive learning environments was also established.

8. CHAPTER EIGHT- CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

Coming to the end of my research journey, this chapter serves to reflect on the research process and the outcomes in relation to the point of departure. The reflection considers how the research findings can be extended into recommendations for further learning environment research in the context of South Africa, reframing the policies to consider responsive learning environments and a framework for design guidelines. Critical to research of this nature is highlighting the contribution to new knowledge, the limitations of the research, and the potential for further research.

8.2 STUDY AIMS REVISITED

This research investigated the relationship between early childhood development (ECD) learning environments and the transformation of early childhood development in South Africa. In Chapter One, I explored the critical position of children in society and the inherent value of early investment in their educational development. My argument considered how people are connected to their environments, particularly during the early years of childhood, when children's perceptions and experiences impact their physical, cognitive, and emotional development. Therefore, the notion of early investment, which includes all aspects of child development, is directly linked to investment in the environment to support children in their development, care, and early learning. The research problem considered how the relationship between quality childhood development and quality learning environments is not recognised in the South African policies to support the transformation of early childhood development. I argue that this oversight has led to the implementation and development of early childhood development policies that disregard the potential quality that could be generated by responsive approaches to learning environment design. The research therefore aimed to explore the

relationship between responsive learning environments and early childhood development policy transformation in South Africa.

The research findings illustrated how the interrelated relationship between children and their environment forms the basis for quality early childhood development. The complexity of this relationship in the ECD microcosm was explored from an **environment-behaviour perspective to include the triad of place, the third teacher, and the third space** (Sections 2.2, 2.3, and 3.2). The **ecological systems model** (Sections 2.2, 2.3, and 3.3) was also applied to include the range of scales of the contextual influences. The quality of the environment was established as being a critical determinant of the quality of child development outcomes (Sections 2.2 and 2.3). A range of criteria that work towards quality environments was established (Section 2.3), and this formed the basis for the development of the methodological approach to evaluating learning environments (Section 4.4) in the context of South Africa. These methodologies were applied to evaluate the quality of a small selection of ECD centres in eThekwini (Sections 5.3), and the findings determined that inequality is evident in the differences between the low-socioeconomic sites and the high-socio-economic sites (Sections 6.3 and 6.5). There was direct engagement with the women who own and work in the centres (Section 6.6), and the findings indicated that the differences in quality were directly related to the limited funding available to the low-socioeconomic sites.

The **impact** on the **quality of the physical environments was considered using a range of criteria** (Sections 4.4.1. and 6.3), which emphasised the complex nature of the architectural problem. Similarly, the **environmental evaluation criteria** (Sections 4.4.1 and 6.4) represented a complex web of influences that could potentially impact the quality of early childhood development. The third layer of complexity was found in the analysis of the way **affordances and interactions between the environment, the child, and the teacher support active learning** (Sections 4.4.2 and 6.5). The final layer of exploration considered how the teachers and principals saw, valued, and experienced their individual ECD centres. Their voices provided insight into the various contextual influences on the micro, meso, macro, and chrono scales.

Analysing the literature (Section 2.4) and the multiple-case study findings (Chapter six—specifically Section 6.6), it became evident that the ECD sector in South Africa is under tremendous pressure in terms of the provision of centre-based care and learning, and there are a range of challenges hindering the progress towards early childhood development transformation. These challenges stand in contrast to the transformation agenda of the National Development Plan and the Integrated Development Plan for ECD, which aim to provide all children with equal access to quality early childhood development. The limitations of the early investment agenda, which is based on the international benchmarks of the UN's Convention on the Rights of the Child and the Sustainable Development Goals (Chapter Two, Section 2.4), lead to furthering the inequalities and inherent discrimination towards disadvantaged and vulnerable communities. Therefore, my research concluded that the transformation of early childhood development is directly related to responsive learning environments. A summary of the key findings in relation to each of the secondary research questions was provided in Table 7-1 (Section 7.2.1). The detailed discussion of the findings (Sections 7.2 and 7.3) shed light on the challenges and, in particular, the fact that the South African policy framework and funding model are unsupportive towards achieving equality in learning environments. The research suggested the need for a review of the policy framework and funding model as they relate to the learning environments. The findings also considered the potential for developing design guidelines as a mechanism with which to achieve equality in learning environments.

8.3 RECOMMENDATIONS

As suggested in the preceding chapter and as a continuation of the research, the conclusion of my study considers recommendations that could benefit the transformation of early childhood development in South Africa as well as in other developing countries with similar challenges. The recommendations also respond to the gap in the literature relating to learning environment research in developing countries and specifically in South Africa. The recommendations consider **learning environment research methodologies, early childhood development policy, and the development of design guidelines**.

8.3.1 RESPONSIVE LEARNING ENVIRONMENT RESEARCH

The research recommends the application of a range of methodologies when conducting learning environment research in the context of developing countries. Early childhood settings in these countries include a broad range of building forms and conditions, as well as the limited involvement of formal architectural design processes that lead to learning environments that do not fit any set pattern or system. The study showed how the inherent informality of the early childhood development infrastructure requires an approach with some flexibility and the use of broader themes rather than very specific checklists.

The research design used in this study provided a comprehensive understanding of the quality of the environments, inclusive of health and safety and the minimum norms and standards, by adopting approaches used in more formal settings found in the developed world. Notably, health and safety and environmental norms and standards form the basis of quality. The proposed ECD Learning Environment Research Approach includes four forms of investigation, as set out below:

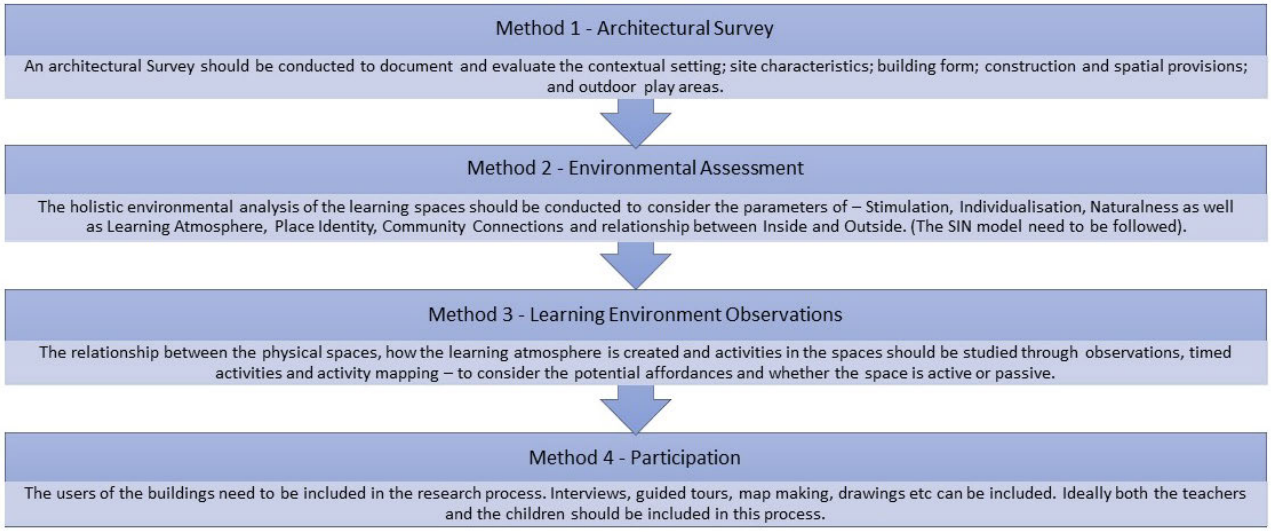


Figure 8-1 Proposed ECD Learning Environment Research Approach

Source: Author (2024)

In this recommended research approach, the inclusion of participation is suggested to include children and to engage with them using different mechanisms. The value of participation became

clear in the literature and is supported by the theoretical approach of spatial justice. In my study, it is evident that this approach can lead to responsive research when following this recommendation, which includes a holistic understanding and considers contextual influences and participatory processes.

The inclusion and leadership of professional architects to the ensure the successful application and implementation of the learning environment evaluation is critical. Registered professional architects, apart from being trained to design buildings, have been trained in postgraduate research, including analysis and interpretation of many kinds of contextual data. It is part of their scope of work to do feasibility studies, workshop potential ideas with communities and write project briefs, and it is the profession best suited to investigate learning sites.

The approach to evaluating the conditions of early childhood development learning environments can be applied in South Africa as an extension of the data gathering processes started by the Department of Education with the early childhood development census in 2022. This could support the process and establish the needs for the improvement and development of the early childhood development sector's infrastructure.

8.3.2 POLICY FRAMEWORK FOR RESPONSIVE ECD LEARNING ENVIRONMENTS

The research findings included several concerns related to the current policy framework for early childhood development in South Africa and identified the need for a policy review. The recommendations include the following aspects that can initiate a change in the transformation trajectory:

- A comprehensive review should be conducted of the challenges in the Integrated Development Plan for Early Childhood Development and its implementation, reported in the research and discussed in Sections 2.4, 6.6, 7.2, and 7.3. The review should be conducted using a process of engagement with ECD providers, NGOs, NPOs, research institutes, and government departments.
- The limitations in the government's funding allocation and funding model need to be acknowledged at the national government level so that it can engage with ECD providers,

NGOs, NPOs, research institutes, and national and local government departments to develop a revised system.

- The critical role of early learning environments needs to be included in the revised policy framework to include mechanisms to support the improvement of existing and the development of new infrastructure that integrates the built form and outdoor spaces.
- A comprehensive design guideline needs to be developed as one of the mechanisms to support the improvement of quality in early learning environments. This comprehensive design guideline needs to establish responsive parameters and criteria that can be used by ECD providers, NGOs, donor organisations, municipalities, and government departments, in collaboration with architectural professionals.
- The critical need to appoint a registered professional architect as part of early learning infrastructure upgrades and development projects must be acknowledged and implemented as part of the policy reform. All processes of development must recognise and include participatory and co-design processes in procedural design practices.
- The role of the architectural professional as an active agent of social change and transformation of the early learning environment must be recognised, in line with SDG 4.

The processes above must involve the participation of key stakeholders, communities, and end users to ensure that all decisions are made from the ground up. This approach will lead to spatial justice as it will negate the failures of the current systems.

8.3.3 PROJECT DEVELOPMENT AND DESIGN GUIDELINES FOR ECD LEARNING ENVIRONMENTS

The research recommends that the following stages be followed when developing an upgrade or a new project for these early childhood development learning environments:

Stage One – Co-creation stage: Understanding the context and the site. A responsive research approach must be followed, and the context of the environment, both physical and human, must be investigated. This process could include the criteria that were established in the architectural survey. When the project includes an existing ECD centre, the complete process presented in

Section 8.3 and Table 8-1 as the ECD Learning Environment Research Approach should be followed. When the project is a new one, an evaluation of the existing ECD facilities should be conducted. These processes form the basis of the next stage of developing a brief and assessing the feasibility of the project. Participation with all relevant stakeholders is critical and they need to be included, even at this early stage.

Stage Two – Co-production: Developing a brief and establishing feasibility. The project brief must be developed using the research insights gained in stage one. The process needs to consider the needs of the ECD provider, staff, children, and their community. Engagement with the supporting NGOs and government departments or municipalities is critical at this early stage to ensure the feasibility of the project. Engagement with community leaders at the initial stage, specifically those in rural and peri-urban areas, can ensure that the project is accepted and that a sense of ownership is established. The potential for the ECD centre to include other community facilities can be explored, as the research found value in combining early childhood development with community services such as churches or health provision. At this point, it is relevant to gain insight into the pedagogic approach of the centre and how the design could support learning. The process needs to be concluded with a feasibility study that considers how the project could be funded (once-off or in phases), and how the local community could contribute towards the construction phase. Once the brief has been refined and the feasibility established, the next phase will include the architectural design of the project.

Stage Three – Co-design: Developing the design. Following a participatory process, an architectural professional should lead the project's development. The design should be based on the research and brief from stages one and two. It is therefore ideal that the same team be appointed for all the stages to ensure continuity. The design process should be based on the proposed design guidelines for responsive ECD learning environments (refer to the proposed framework for the design guidelines based on the pattern language). The design process concludes with the development of detailed drawings for approval by the local authority and obtaining costings for the construction phase.

Stage Four – Co-delivery: Constructing the project. The construction phase can commence once the required approvals are in place. As in the other stages, it is critical to consider ways to include all the stakeholders in the process of finalising the decisions and in the construction itself. Decisions about fittings, equipment, finishes, colour, etc. need to include consultations with the end user and be guided by the architectural professional. The construction process should be concluded with signoff from the relevant authorities before occupancy can commence.

Stage Five – Co-evaluation: Post-occupancy evaluation. It is critical to conduct an evaluation after a period of occupancy to ensure quality and improve the approach to future interventions. These evaluations can follow a similar methodology to that in stage one, or internationally established evaluation tools can be applied.

The final part of the recommendation follows the methodology of the pattern language to establish a framework for the ECD design guidelines referred to in the policy recommendations. The key principles of the pattern language are to develop architectural design responses to recurring problems identified through research. Ideally, the development of the patterns should include a participatory process to ensure that the proposed solutions address the needs of the occupants, as discussed in Section 2.3.3. The framework for the design guidelines will therefore be based on the research from this study. It can only be a framework at this stage, as the need for further participation and collaboration is acknowledged as a further stage in the process.

The framework for the guidelines is structured to consider the scales of contextual influences, as it is an extension of the theoretical approach of the ecological systems model. The microsystem patterns will continue through the theoretical model of the third space, the third teacher, and place. The framework is established as a point of departure and must be built on by further research and participatory processes, as an extension of the policy review recommended in Section 8.3.2.

Table 8-2 Design Guideline Framework

Contextual System	Potential Influences	Potential Patterns	Description of the Problem

Macro System	Broader context – province, municipality, urban/rural, culture, religion, socio-economics, geology, and climate	Place identity and community	The location of the centre is situated in its specific broader context, with a distinct character or identity. The nature of this character needs to be considered to see how this will influence the design to foster a sense of belonging and connection with the community.
Meso System	Intermediate context – neighbourhood, community facilities, street, neighbouring sites, site edges, transport links, access, geology, and climate	Place identity and community	The intermediate context of the neighbourhood or street has distinct characteristics that will be different from those of a neighbourhood or street nearby. The unique aspects of the context need to considered to ensure that the design responds to its setting.
Micro System	Immediate context – whole site, existing buildings, natural features, terrain, outdoor play area, and internal spaces	Place – naturalness and flow between the inside and outside. Third teacher – stimulation and a learning atmosphere. Third space – Individualisation, place identity, and community.	The design of the whole site, the outdoor play areas, and the building's exterior and interior will influence the level of quality achieved through all three broad patterns of the place, the third teacher and the third space. Each of the categories that form these three main patterns has several criteria to be considered. Detailed patterns need to be developed to explore the response.

Source: Author (2024)

The detailed development of the patterns will require further exploration that is beyond the scope of my research.

8.4 CONTRIBUTION TO NEW KNOWLEDGE

The research study makes an original and unique contribution of new knowledge to the discipline of architecture in South Africa at the methodological, theoretical, empirical, and contextual levels. The study makes a further unique contribution to the field of environment and behaviour studies, specifically the emerging field of learning environment research. The study contributes further towards the global and national sustainable development goals for early childhood development.

Firstly, the research contribution addresses **the gap in learning environment research in developing countries, specifically South Africa.** The review of literature found that the majority of the research investigating the quality of learning environments and physical learning spaces was predominantly from developing countries, such as the UK, US, Europe, and Australia.

Secondly, the research contribution included the **application of a holistic environmental quality evaluation method for early childhood development in South Africa.** The scale of this multi-case study is limited in scope, providing only a small sample of the range and qualities of early childhood development learning environments in South Africa. The study indicates that this methodology can be successfully applied in South Africa, where early childhood development learning environments form a range of typologies. The recommendations presented in Section 8.3.1 provide a research approach that could be applied in South Africa and other developing countries with similar ECD infrastructure.

Thirdly, the study presents the **lived experiences of women from the early childhood development sector in eThekwini**, thus contributing towards a better understanding of how the ECD policies impact their efforts towards quality early childhood development. Although the literature reported on the challenges in the ECD sector, there was limited evidence that included women's voices on the issues related to how the policies influence the quality of the learning environments. Furthermore, there was limited evidence from the region of KwaZulu-Natal and from eThekwini specifically.

Fourthly, the **research methods that were fused** in this thesis have assisted in illuminating the site-specific realities and practices of learning environments in early childhood development centres. These research methods are embodied methods, which produce direct knowledge and always transform the spatial conditions of a place. The research has also shown how knowledge is constructed in the process of collaboration between multiple different ways of enacting a place and being enacted by the place. This study has shown the **possibility of developing place-based research methods for early childhood education praxis,** with the aim of understanding **how they might transform our notions and practices of early childhood centres in an unequal South Africa.**

Fifthly, the **theoretical and conceptual framework provides a transformative, comprehensive, and innovative approach to understanding early childhood development learning environments**. Together, these enable the development of principles to frame a policy for responsive ECD learning environments towards the transformation of early childhood development in South Africa (presented in Sections 8.3.2 and 8.3.3).

The final contribution is the **comparative nature of the case study,** which sheds light on the nature of the inequalities between high socio-economic and low socio-economic contexts. The review of the literature from South Africa and other developing countries provided limited evidence of this knowledge.

8.5 RESEARCH LIMITATIONS AND POSSIBILITIES FOR FURTHER RESEARCH

Although the research made a range of contributions to knowledge, provided recommendations, and explored the research problem, there are inherent limitations due to the nature of a PhD project in terms of scale, scope, and logistics. Therefore, it is critical to acknowledge the nature of the limitations that emerged during the research process and the drafting of the findings and conclusions.

The research was limited by the language and cultural barriers of a white English-speaking researcher conducting research in an area where most of the participants were African and isiZulu-speaking. Although I found that most participants were fully conversant in English, the

interviews with some of the women could have contained more depth if they had been conducted in their home language.

The original research design included child participation, as documented in Chapter One, Section 1.3.5. Removing this component of the study limited the notion of child rights as well as the potential for exploring the experiences of children. From a methodological perspective, this exclusion is not ideal, and it is important that future research include children with the appropriate ethical considerations. The complexities of obtaining parental consent from all the parents at every school sampled are challenging; however, working with a smaller group of children could provide effective insights and should be explored as an extension of this research design.

A further limitation was the impact of the COVID-19 pandemic. The research proposal was approved in 2019, before any conception of the COVID-19 pandemic existed. Most early childhood development centres were closed for several months, and once they re-opened, very few children attended, and the learning environments were altered dramatically to conform to the sanitation and social distancing requirements of the time. It would be ignorant to overlook how the findings relating to the quality of the learning environments were impacted by the dramatic changes imposed. However, the inclusion of COVID-19 influences as part of the ecological systems model provided the study with findings that were in line with the research aims and objectives. Furthermore, the differences found between the high and low socio-economic sites in their response to the restrictions deepened my understanding of the inequality of their early childhood development and their learning environments.

Although my study does have limitations, the nature of the project means that the outcomes of this study could be used as a starting point for the following:

- Developing a scholarship of architectural and learning environment research in the context of South Africa needs to be deepened and extended.
- Adding to the existing body of knowledge around early childhood development in South Africa and how the challenges hampering transformation can be addressed.

- It has provided theoretical and methodological models that require refinement and further testing to become established norms.

The research can be furthered through a deeper exploration of how the findings can be translated into actionable strategies in low-resource environments and applied to other regions of South Africa or to other countries with similar socio-economic challenges

8.6 CONCLUDING REFLECTIONS

As an architectural research project, the positioning of the role of the architect or architectural professional was not foreseen as a particular aim or objective. However, inherent in the study of the relationship between people (children) and their environment is the way that the physical spaces are designed, as this determines the potential quality of the relationship. The positioning of the important role of the design process and the architectural profession emerged when reflecting on the research process and findings. This reflection enables this research to be a direct extension of my Masters research project, where the purpose of architecture was established as the process of creating places for people to dwell in. Through this research study, it has become evident how complex and intertwined our relationship with our environment is. Through this understanding, the research serves to illustrate the critical role of research as part of the architectural design process. The potential of participation as part of the research-driven design process was confirmed and relates to the pedagogic approach of research-driven architectural design and urbanism imbedded in my work in the architectural postgraduate programmes at UKZN (see list of publications).

This chapter provided a reflection on how the study responded to the research problem of the positioning of learning environments as a mechanism towards early childhood development transformation. The research illustrated the complexity of the challenges faced by the early childhood development sector and how the policy framework increases inequalities in disadvantaged communities. The theoretical and conceptual framework of phenomenology and ecological systems theory enabled the exploration of the multi-layered contextual influences in a small group of early childhood development centres in eThekwini, KwaZulu-Natal. The

comparative nature of the multiple-case study provided insight into the extent of the inequality inherent in these learning environments in South Africa. The lens of spatial justice led to the use of the findings to consider recommendations for policy reform. Thus, the research, although limited in scope, could be viewed as a step towards addressing the challenges hampering the transformation of early childhood development in KwaZulu-Natal and in South Africa.

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APPENDICES

A.1 ETHICAL CLEARANCE

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

02 July 2020

Miss Magdalena C Cloete (941351714)
School Of Built Env & Dev Stud
Howard College

Dear Miss Cloete,

Protocol reference number: HSSREC/00001032/2020
Project title: Perceptual Experience as determinant in developing models of Responsive Educational Architecture: a multiple case study of Early Childhood Development Centres in Durban, South Africa
Degree: PhD

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 10 February 2020 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 02 July 2021.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)

/dd

Humanities & Social Sciences Research Ethics Committee
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Tel: +27 31 260 8350 / 4557 / 3587
Website: http://research.ukzn.ac.za/Research-Ethics/

Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

INSPIRING GREATNESS

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

01 October 2021

Magdalena C Cloete (941351714)
School Of Built Env & Dev Stud
Howard College

Dear MC Cloete,

Protocol reference number: HSSREC/00001032/2020
Project title: Perceptual Experience as determinant in developing models of Responsive Educational Architecture: a multiple case study of Early Childhood Development Centres in Durban, South Africa

Approval Notification – Recertification Application

Your request for Recertification dated 27 September 2021 was received.

This letter confirms that you have been granted Recertification Approval for a period of one year from the date of this letter. This approval is based strictly on the research protocol submitted and approved in 2020.

Any alteration s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study must be reviewed and approved through the amendment /modification prior to its implementation. Please quote the above reference number for all queries relating to this study.

PLEASE NOTE: Research data should be securely stored in the school/department for a period of 5 years

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)

/dd

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

03 July 2024

Magdalena C Cloete (941351714)
School Of Built Env & Dev Stud
Howard College Campus

Dear MC Cloete,

Protocol reference number: HSSREC/00001032/2020
Project title: Perceptual Experience as determinant in developing models of Responsive Educational Architecture: a multiple case study of Early Childhood Development Centres in Durban, South Africa
Amended title: Transformation of early childhood development and responsive learning environments _ a collective case study in Outerwest, eThekwini, KwaZulu-Natal, South Africa
Degree: PhD

Approval Notification – Amendment Application

This letter serves to notify you that your application and request for an amendment received on 01 July 2024 has now been approved as follows:

- Change in title

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form; Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

Best wishes for the successful completion of your research protocol.

Yours faithfully

[redacted]

.....
Professor Dipane Hlalele (Chair)

/dd

A.2 RESEARCH INSTRUMENTS

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

INFORMED CONSENT

Information Sheet and Consent to Participate in Research

Date: 06 November 2020

Dear Principle/Teacher/Carer

My name is Magdalena Cloete from the School of the Built Environment and Development Studies at the University of Kwa-Zulu Natal based on Howard College Campus, Dennis Shepstone building. My contact information is as follows: [redacted]ac.za, [redacted]

You are invited to consider participating in a study that involves research in Learning Spaces towards a PhD in Architecture. The topic of the study is focused on: Spatial Experience as determinant in developing models of Responsive Educational Architecture: a case study of Early Childhood Development Centres in Durban, South Africa.

The aim and purpose of this research is to understand how the children and adults that use learning spaces everyday experience their learning spaces and this impacts on their wellbeing or development.

The case study includes 8 pre-school facilities in the Hillcrest/Embo area. The study is expected to include the children, parents, teachers and principle as well as representatives from NGO's or Religious Organisations affiliated with a centre.

Adult participation will involve an interview and possible creative visual activities conducted as group exercises in a natural teaching setting. The duration of your participation if you choose to enroll and remain in the study is expected to be for 1 month only. Although the activity should be completed in one or two visits.

The study will not involve any risks and/or discomforts. We hope that the study will allow design interventions at some of the centres to improve the learning environments as the final phase include design research. There may in some cases be no direct benefits to participants. However the broad outcome of the study is to impact on the policies governing early childhood care and development by firstly creating awareness of the impact of learning space design and secondly by developing design guidelines for the implementation of physical infrastructure for Early Childhood Development Centres.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSSREC/0000 1032/2020).

In the event of any problems or concerns/questions you may contact the researcher at (provide contact details) or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000

KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Please take note of the following considerations:

Participation in this research is voluntary. Participants may withdraw participation at any point, and that in the event of refusal/withdrawal of participation the participants will not incur penalty or loss of benefit to which they are normally entitled.

To withdraw from the study the participant are required to inform the researcher in writing of their decision providing reasons for their withdrawal. This will enable the researcher to enrol another participant if required. The nature of the research do not pose and risk or discomfort, however as participation is voluntary withdrawal will be accepted if requested.

There will be no costs incurred by participants as a result of participation in the study.

Centres included in the study can choose to not be named. Participants similarly can stay anonymous. To protect confidentiality no personal information will be will be included in the recording and reporting of the research.

Describe the fate of the data and stored samples.

CONSENT FORM

(To be signed by the participant before each interview)
One copy to participant, and one signed copy to the researcher

I have read the information presented in the information letter about a project being conducted by Magdalena Cloete of The School of Built Environment and Development Studies at Howard College, UKZN, under the supervision of Prof Ernest Khalema. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and additional details I wanted.

I am aware that I have the option of allowing my interview to be recorded to ensure accurate recordings of my responses.
I am aware that my quotations will be anonymous.
I was informed that I may withdraw my consent at any time without penalty by advising the researcher.
I was informed that if I have any comments or concerns resulting from my participation in this project, that I may contact the researcher.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

☐ Yes ☐ No

I agree to the use of anonymous quotations in the final research project report that comes of this research.

☐ Yes ☐ No

I agree to allow audio-recording during the interview.

☐ Yes ☐ No

Participant name :.....(please print)

Participant signature.....

Witness name:.....**(please print)**

Witness signature.....

Date.....

Translator name .....(if applicable)

Translator signature.....

General information log for Site observations			
Site location:		Date: Time:	
Date of building completion:			
Number of Pupils:			
Number of Adults:			
Layout of Bulding: *Describe form*			
Building Floor Area:			
Number of Class/Play Rooms:			
Size of Class/Play Rooms:			
Children per Class/Play Rooms:			
Support Areas:			
Outdoor Play Area: *Describe space*			
Construction / Materials: Floor Walls Ceiling Roof Windows Doors Lighting			
Fittings and Fixtures: *Describe*			
Condition of Building and Site:			
Sketch of plan:			

Learning Environment log for Site observations			
Site location:		Date: Time:	
Pedagogic / Learning Approach:			
Naturalness: Daylighting Fresh Air Noise Toilets (smells) Views of nature			
Individualisation: Low space density Scale Personalisation Flexibility Institutional feel Display Navigation			
Stimulation: Colours Balance open / private Clutter Outdoor space Texture Variety in play facilities			
Learning Atmosphere: (Third Teacher)			
Flow between inside and outside:			
Place Identity:			
Connection with Community:			
Response to COVID-19			

	Observation Tool MC350				
Date:	**Site:**			**Space:**	
No.	**Time**	**Illumination**	**Noise**	**Temperature**	**Humidity**
	Sketch of space to indicate where reading was taken:				

A.3 RESEARCH OUTPUT

Journal Article and Chapters:

1. M.C. Cloete., 2024. Hearing the Voice of Women working in Early Childhood Development Learning Environments in South Africa. Journal of Inclusive cities and Built environment. Vol. 4 Issue 7, P 1-14.
2. Cloete, M.C., & Govender, V. (2024). Towards a sustainable urban community at the Point development in Durban. CSID Journal of Infrastructure Development, 7(1). https://doi.org/10.7454/jid.v7.i1.1099
3. Govender, V. & Cloete, M.C. (2023) Exploring the role of sustainability in peri-urban communities using innovative urban strategies: A case study of Giba Gorge precinct, eThekwini, KZN. Handbook of Research on Managing the Urban-Rural Divide Through an Inclusive Framework, Chapter 13. IGI Global.
4. Rout, M.J. & Cloete, M.C. (2022) Exploring the concept of Deaf-Space in Architecture: Towards a school for the Deaf. International Journal of Technology and Inclusive Education (IJTIE), Volume 11, Issue 1 P1717 – 1726.
5. Cloete, M.C. & Yusuf, S. (2018) Conceptual commentary of public spaces in Durban, South Africa. Town and Regional Planning Journal No 73. Special Edition Urban Design in South Africa. P33-46.

Conference Presentations:

1. Govender, V. & Cloete, M.C. Research driven architectural studio. Innovations of the Scholarship of Teaching and Learning (Isotl) Conference September 2023
2. Mancotywa, M. & Cloete M.C. Exploring Inclusive approaches to visual impairment in the built environment. August 2023
3. Cloete, M.C. Hearing the voice of women working in early childhood development learning environments in South Africa. 2nd International Conference on Inclusive Cities. August 2023

4. Cloete, M.C. Considering the value of early investment – early childhood development learning environments in South Africa. National Development Plan and State Capacity Conference. November 2022 UKZN
5. Cloete, M.C. Considering the quality of early childhood development learning environments in the context of South Africa. International Society for Educational Planning October 2022
6. Rout, MJ & Cloete, M. Exploring the concept of DeafSpace in Architecture. London International Conference of Education 2021.
7. Cloete, M.C. LARASA International Conference (Parks and Recreation) 2018 – considering childhood development in design outdoor play
8. Cloete, M.C. International Educational Architecture Conference 2018 – Copenhagen, Denmark: “Architecture and Childhood Development –Children’s spaces in South Africa”
9. Cloete, M.C. 2016 Responsiveness in Architecture: A theory applied to children’s spaces. Architectural Education Forum Symposium. School of Architecture. University of Witwatersrand. (Poster Presentation)