

THE IMPACT OF THE PHYSICAL ENVIRONMENT ON CHILDREN'S EXPERIENCES OF EARLY
CHILDHOOD EDUCATION

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2025

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A dissertation submitted to Auckland University of Technology in partial fulfilment of the requirements
for the degree of Master of Education.

ABSTRACT

This dissertation presents a critical integrative literature review examining the influence of the physical environment on children's experiences in early childhood education (ECE), with a particular emphasis on the context of Aotearoa New Zealand. While pedagogy and teacher-child relationships remain central to early learning, this review focused on how elements such as spatial layout, aesthetics, sensory design, access to nature, and cultural visibility influence children's holistic development, wellbeing, and sense of belonging.

Framed by the research question, how does the physical environment impact children's experiences in ECE? the review synthesised both international and local literature through the theoretical lenses of sociocultural theory, bioecological systems theory, and the principles of New Zealand curriculum *Te Whāriki* (MoE, 2017). The findings highlight the uniquely diverse and bicultural context of Aotearoa New Zealand as central to understanding ECE settings and examine how historical developments, regulatory frameworks, and sector privatisation have contributed to wide variability in physical environments. Further the review found that thoughtfully designed environments, characterised by environment elements, support children's cognitive growth, emotional regulation, social competence, spiritual expression, and identity formation. However, the literature also revealed significant challenges, including inequitable funding, regulatory constraints, and limited professional focus on spatial design and cultural responsiveness. Overall, the review concluded that physical environments must be recognised as active contributors to children's learning and development, with important implications for educators, policymakers, and centre designers. It offers actionable recommendations to promote equitable access to well-designed, flexible, and culturally sustaining environments. Finally, this work contributes to ongoing discourse on environmental quality and its role in shaping more equitable and transformative early childhood education in Aotearoa New Zealand.

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LIST OF ACRONYMS

| | | |
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| AUT | - | Auckland University of Technology |
| ECE | - | Early Childhood Education |
| ERIC | - | Education Research and Information |
| ERO | - | Education Review Office |
| JSTOR | - | Journal Storage |
| MōE | - | Ministry of Education |
| OECD | - | Organisation for Economic Co-operation and Development |
| UNESCO | - | United Nations Educational, Scientific and Cultural Organisation |

ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor used artificial intelligence tools or generative artificial intelligence tools (unless it is clearly stated, and referenced, along with the purpose of use), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.”

Signed: _____

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my supervisor, Dr. Sarah Probine, whose invaluable guidance, support, and encouragement have been instrumental throughout the course of this review. Her expertise and thoughtful feedback and belief in my work not only enriched this study but also gave me the confidence to persevere through challenges. She consistently steered me in the right direction and enabled me to complete this work successfully. I am truly grateful for her mentorship and dedication.

My heartfelt thanks also go to my beloved husband and two children for their unwavering support, patience, and understanding throughout my academic journey. Your love, sacrifices, and constant encouragement carried me through the long days and sleepless nights. This achievement is as much yours as it is mine.

To my parents, although you are not physically present with me, I have always felt your blessings and silent support. Your inspiration has been a guiding light in my life, and I am deeply grateful. I dedicate this accomplishment to your enduring inspiration and silent strength.

Finally, I would like to acknowledge my wonderful colleagues, whose friendship, encouragement, and assistance were always available when I needed them most. Their support has been truly appreciated.

CHAPTER 1

Introduction

This dissertation presents a critical literature review that explores the impact of the physical environment on children's experiences in early childhood education (ECE) settings. While recognising that pedagogy and teacher-child relationships are central to early learning, this review focuses specifically on the physical environments that children encounter and how these spaces shape their development, wellbeing, and a sense of belonging. The physical environment encompasses a range of interrelated concepts, including spatial layout, aesthetics, sensory qualities, access to nature, cultural responsiveness, and the availability of learning resources. These elements not only influence how children move, engage, and feel within a space, but also reflect broader pedagogical and cultural values. In both international and Aotearoa New Zealand contexts, there is growing recognition that thoughtfully designed environments serve as active contributors to the learning process, often referred to as the "third teacher" (Robson, 2017). Theoretical perspectives such as Vygotsky's sociocultural theory and Bronfenbrenner's bioecological systems theory underscore the importance of the environment as a mediator for learning and development of children. Vygotsky emphasised the role of cultural tools and social interaction in cognitive growth (McLeod, 2025), while Bronfenbrenner conceptualised the physical setting as part of the child's microsystem, directly shaping everyday experiences (Brodie, 2024). This introductory chapter establishes the conceptual and contextual foundation for the review. It defines key terms, outlines the significance of the physical environment in ECE, introduces the rationale and research aims, and explains the methodological approach used to guide the selection and analysis of literature.

In Aotearoa New Zealand, *Te Whāriki: He whāriki mātauranga mō ngā mokopuna o Aotearoa Early childhood curriculum* (Ministry of Education, 2017), recognises the physical environment as a key contributor to holistic development. The curriculum highlights how cognitive, social-emotional, physical, spiritual, and wellbeing are interconnected. Children are positioned as competent and confident learners and communicators who can explore, learn, and grow in a supportive and engaging environment. The physical environment is recognised for its potential to support the curriculum's key principles; whakamana (empowerment), kotahitanga (holistic development), whānau tangata (family and community), and ngā hononga (relationships). Importantly *Te Whāriki* (MoE, 2017) is built upon Māori pedagogical traditions that emphasise relationality with people and land. McLeod (2025) notes that the curriculum recognises children as part of a wider relational network, one that encompasses spiritual and ecological connections

that honour Māori perspectives. Accordingly, the curriculum encourages ECE centres to intentionally design and utilise physical environments to nurture children's wellbeing, learning, and sense of identity.

According to the Ministry of Education (2024), over 96% of children attend ECE services before starting school, spending an average of 20-30 hours per week in these settings. Further, the sector is diverse, providing a range of provisions. ECE services fall under three groups, and can be identified as privately run, community based, and state-run services. Each kind of service varies in its physical layout, resources, and approach to learning and development, adding complexity to how physical environments are designed and experienced by children in this context. This diversity is further complicated by the increasing privatisation of the ECE sector which has resulted in differences in funding and resources across ECE settings (Kearns & Ritchie, 2020). For instance, in areas where parents can afford to pay additional fees, centres have more access to resources, enhancing the environment. Conversely, in lower socio-economic areas, fewer resources may restrict the ability to improve the physical environment, resulting in inequities for children. Further, privatisation may result in profit being prioritised over quality, leading to unequal access to well-designed learning environments, ultimately impacting children's development and wellbeing (Gallagher, 2022).

There are multiple factors that influence the design of ECE environments, including architectural design, health and safety regulations, cultural values, curriculum frameworks, and the socio-economic context. Because of these broad and complex factors, literature pertaining to physical environments in ECE is widely dispersed. Some studies focus on architectural design and spatial layout, whilst others examine pedagogical use of space, cultural inclusivity, or regulatory frameworks. This fragmented knowledge makes it difficult for educators, policy makers, and designers to access a clear understanding of how physical environments impact children's experiences. As a consequence, some children may benefit from rich stimulating environments, whilst others may experience settings that merely meet minimum regulatory standards.

Whilst there is a growing awareness that physical environments in ECE settings have a crucial impact on children's development, wellbeing, and sense of belonging, this area remains underexamined in research and policy (Matthews & Lippman, 2019). As outlined in this chapter, the physical environment integrates multiple interconnected elements such as spatial design, aesthetics, sensory features, and cultural responsiveness that directly influence how children experience their early learning. In Aotearoa New Zealand, these concepts are embedded in *Te Whāriki* (MoE, 2017) and reflect Māori values and a view that children develop holistically. However, the diversity of the sector, along with increasing privatisation, has led to inconsistencies in how physical environments are resourced and managed, raising critical concerns about equity. These complexities underscore the urgent need for a more integrated and theoretically

grounded understanding of ECE environments, that can inform policy, guide practice, and ultimately support more equitable and enriching experiences for all children.

1.2 Rationale for the research

This dissertation responds to the dispersed and multidisciplinary nature of knowledge concerning how physical environments in ECE settings shape children’s holistic development, wellbeing, and sense of belonging in Aotearoa New Zealand. Rather than focusing on isolated aspects of the environment, such as play spaces or cultural displays, this review considers how multiple environmental factors such as spatial layout, aesthetics, sensory features, cultural frameworks interact to shape children’s learning and experiences. To support this comprehensive focus, the review adopts an integrative approach, drawing on a broad range of sources including policy, licensing criteria, empirical research, and relevant theoretical and pedagogical frameworks. By systematically reviewing and analysing these sources, the study aims to synthesise key insights to inform the design of ECE environments that support the learning and wellbeing of children. Additionally, the review highlights emerging trends and identifies gaps in current research, contributing to a more informed and equitable approach to ECE environment design in Aotearoa New Zealand.

1.3 Aim and research questions

The aim of this research is to explore how the physical environment impacts children’s experiences in ECE settings in Aotearoa New Zealand, with a specific focus on how the physical environment contributes to children’s overall development, emotional wellbeing, and sense of belonging within ECE settings. This review is guided by the following overarching research question and three sub-questions, which shape the scope and organisation of the literature examined:

Research Question

What is the impact of the physical environment on how children experience early childhood education?

Sub questions:

1. How do specific elements of the physical environment, such as spatial layout, lighting, and acoustics, influence children’s holistic development in early childhood education settings?
2. What aspects of the physical environment impact children’s wellbeing and sense of belonging in early childhood education?
3. What are the foundational frameworks that inform how ECE environments are conceptualised and developed?

1.4 Methodology

An integrative literature review was selected as my topic spans multiple disciplines, including education, psychology, design, and policy. This particular approach enables the inclusion and synthesis of diverse sources (Cronin et al., 2008), to build a well-rounded understanding of the topic. The integrative approach allows flexibility by integrating structured methods and thematic exploration of both empirical and non-empirical materials (Dawadi et al., 2021). The inclusion of grey literature such as policy documents, policy frameworks, and curriculum guidelines, was essential to understand the direct influence on how ECE environments are conceptualised and implemented in Aotearoa New Zealand. This methodological flexibility ensured that both research evidence and broader contextual narratives were captured, reflecting the complex, multifaceted nature of physical environment design in ECE (Li & Wang, 2018).

Specific inclusion and exclusion criteria were applied to ensure the relevance and rigour of this integrative literature review. This review primarily focused on peer-reviewed journal articles and empirical studies published within the past fifteen years, with some influential works outside this range included for theoretical significance. Grey literature, including policy documents, curriculum frameworks, and sector reports relevant to New Zealand's ECE context, were also reviewed to capture policy and practice perspectives. Both New Zealand based studies and international research from comparable ECE contexts were considered to support broader application. Excluded from the review were non-peer-reviewed opinion pieces, blog posts, and popular media articles, as well as studies published prior to 2014 (unless foundational to the theoretical framing). Research unrelated to early childhood settings or not directly addressing the physical environment was also omitted to maintain a clear focus on the study's aims.

A systematic search was undertaken to identify and evaluate peer-reviewed journal articles and studies published within the past fifteen years. Data bases used included Google Scholar (via AUT), ERIC, JSTOR, SAGE, and Ministry of Education websites. These databases were selected to reflect the interdisciplinary nature of the topic. Eric was used for educational research, the Ministry of Education website provided access to official curriculum and policy documents. JSTOR, SAGE, and Google Scholar covered broader literature across social science, design, and child development. Search terms such as “early childhood education”, “ECE physical environment”, “physical design”, “children's experiences”, “holistic development”, and “regulatory frameworks in ECE”, guided the search process.

A range of sources were included in the review based on their relevance to the research questions, methodological quality, and contribution to understanding the physical environment in ECE. Preference was given to peer-reviewed empirical studies and literature, although important texts outside this range were included where theoretically significant. In addition to academic sources, curriculum and policy documents such as *Te Whāriki* (MoE, 1996; 2017), the ECE Licensing Criteria, and relevant government

reports were reviewed. These were selected for their direct influence on how ECE environments are conceptualised, designed, and implemented in Aotearoa New Zealand. In addition to empirical studies and policy documents, a small number of authoritative textbooks and theoretical works were included to provide foundational context and support the development of conceptual frameworks. Additional sources cited throughout the review provided important background theory, policy context, and broader support for discussion, but were not reviewed as closely as the core literature.

A two-phase analysis process was employed to ensure a systematic and conceptually grounded interpretation of the literature, enabling an initial broad thematic exploration and then a more focused, in-depth analysis of how environmental factors impact children's development, wellbeing, and sense of belonging. In phase one, all articles and documents were thematically analysed to identify key factors influencing the design and development of the physical environment in ECE. This analysis uncovered key design features such as visibility and flow, spatial diversity, access to nature, aesthetic coherence, and cultural responsiveness. These themes were then applied to structure chapter three of the dissertation, resulting in the development of a guiding framework. In phase two, this framework was applied as an analytical lens to examine the impact of these design features on children's holistic development, wellbeing and sense of belonging. Each factor was evaluated for how it supported children's learning and development, using evidence drawn from both empirical research and policy analysis. Overall, this systematic yet flexible approach ensured that the review captured both the breadth of existing knowledge and the depth of contextual factors shaping ECE environments in Aotearoa New Zealand.

Ethics

The study did not include any form of primary data collection and, therefore, it did not require ethical approval. As this review entirely relied on previously published literature. All sources were properly cited and followed academic standards to acknowledge the original authors and to ensure research integrity.

1.5: Dissertation Overview

This integrative review unfolds throughout five chapters, exploring the impact of physical environments on children's holistic development, wellbeing, and sense of belonging within ECE settings in Aotearoa New Zealand. Each chapter provides a critical understanding of the topic, drawing on theoretical, policy, and pedagogical perspectives.

Chapter one has introduced the research topic and rationale, highlighting the significance of physical environments in shaping young children's early learning experiences. It has outlined the research aims, questions, and structure of the dissertation as well as the methodological approach guiding the literature review.

Chapter two presents a critical review of literature and theoretical perspectives that frame understanding of physical environments in ECE. It traces the historical progression of ECE environments from early influences like Froebel, the later impact of the Reggio Emilia Approach, through to the unique contributions of community-based and culturally grounded approaches in ECE in Aotearoa New Zealand. The chapter explores key theoretical frameworks, including Vygotsky's sociocultural theory and Bronfenbrenner's bioecological systems theory both of which have significantly informed the development and pedagogical intentions of Te *Whāriki* (MoE, 2017). It also considers the curriculum as a value-based curriculum and cultural framework that informs spatial decisions in ECE. This chapter establishes a conceptual foundation for analysing how space operates pedagogically, socially, and culturally within ECE settings.

Chapter three outlines what physical design means in ECE and how different types of provisions are shaped by values, philosophies, and operational frameworks. It also examines the impact of privatization, licensing, and funding disparities on physical environment quality. The chapter further discusses design requirements and regulatory standards influencing indoor and outdoor spaces, accessibility, visibility, and safety. It concludes by presenting a conceptual model that connects these various influences and critically reflects on areas of conflict and complexity in current ECE practices.

Chapter four discusses how children experience well-designed environments. It focuses on how specific features such as flow and visibility, aesthetic coherence, natural elements, and cultural responsiveness, support different aspects of holistic development, sense of belonging, and belonging. Drawing on current research, the chapter highlights both the benefits and challenges of existing environments, including issues related to regulation, funding, and cultural representation. It emphasises that physical spaces should reflect children's rights, identities, and diverse ways of being.

The final chapter draws the review to a close, synthesising and interpreting the findings in relation to the research questions, highlighting the complex interplay between physical environment, pedagogy, and policy in shaping children's experiences. It discusses the implications for educators, policymakers, and centre designers, drawing attention to the need for culturally responsive, flexible, and well-resourced spaces in supporting children's learning, development, and sense of identity.

CHAPTER TWO

DEVELOPMENT OF EARLY CHILDHOOD EDUCATION PHYSICAL ENVIRONMENT

2.1 Introduction

Early childhood education (ECE) has changed significantly since its conception, due to historical, cultural and policy-driven shifts. These shifts have impacted not only development of pedagogical approaches but also the physical environments in which young children learn and develop. ECE has evolved through the influence of key educational theorists such as Friedrich Froebel's Kindergarten Movement (Tovey, 2016) and Loris Malaguzzi's Reggio Emilia philosophy (Robson, 2017), which emphasise the importance of aesthetics, flexibility, and children's active engagement with space and materials. Globally, these ideas helped to transform ECE settings into creative, explorative, and nature-friendly spaces, where children can develop holistically. These global ideas have also influenced the design and conceptualisation of early childhood education environments in Aotearoa New Zealand (Lee, 2013), highlighting the ways physical environments can support culturally responsive and developmentally appropriate learning experiences.

This chapter traces the historical development of ECE physical environments, beginning with early informal learning settings and moving through key international educational movements and philosophies. It highlights how ideas about space and pedagogy have evolved, and how these have influenced the design of environments where young children learn and grow. Understanding this historical context provides a foundation for exploring how such influences have shaped, and continue to shape, physical environments in ECE settings in Aotearoa New Zealand (Lee, 2013).

The chapter is structured in four key sections. It begins with a global overview of the historical development of ECE learning environments, including the influence of major theorists and international educational movements. The second section explores how these ideas were adapted in the New Zealand context, including the incorporation of Māori cultural knowledge and the emergence of locally grounded ECE models. The third section discusses the introduction and evolution of *Te Whāriki* (MoE, 1996; 2017), examining how the curriculum has influenced environmental design. Contemporary challenges impacting ECE environments due to privatisation are then examined. Finally, the chapter considers emerging priorities, examining how ecological literacy, biculturalism, and place-based pedagogy are reshaping the design and purpose of ECE environments in Aotearoa. By tracing the historical evolution and theoretical influences on early childhood education environments, the chapter responds to the third sub-question, which explores the foundational frameworks that inform the conceptualisation and development of ECE environments. It establishes the contextual base for analysing how these foundations continue to shape contemporary ECE settings in Aotearoa New Zealand.

2.2 Historical Progression of ECE Physical Environments

The roots of early childhood education go as far back as the early 1500s, when education was largely considered an informal process. Children's learning environments were basically home and community, and knowledge was passed down orally and through practical engagements. During this period, children were educated by their parents, elders, and community leaders. The first semi-formal learning settings were established in religious institutions. In the 16th century, Martin Luther (1483-1546), emphasised the concept of educating young children, believing that it was important to teach literacy at an early stage in order to understand the religious texts, especially the bible (Bonney, 2024). By emphasising literacy and education, he was able to develop a formal schooling system where children were taught basic reading and writing. Most of these early learning spaces were not designed for young children. They had fixed seating arrangements, minimal play areas, and an emphasis on discipline rather than exploration (Bonney, 2024).

During the evolution of ECE, the ideas of key philosophers and theorists began to shape the design and use of physical learning environments. One significant figure was John Amos Comenius (1592- 1670), a Czech philosopher and educator, believed to be the pioneer of modern education (Sitarska, 2015). Although his work did not directly address the physical environments of ECE, he believed that education should start at an early age and should be interactive, including hands-on experiences. According to Sitarska (2015), Comenius's work laid a theoretical foundation for later developments in ECE learning environments, helping to establish child-centred spaces that addressed the developmental needs of young children. Comenius's ideas about sensory exploration were expanded on by philosophers such as Jean-Jacques Rousseau (1712-1778) and Johann Heinrich Pestalozzi (1746-1827), who argued that children learn best when they are allowed to explore their natural environments. Kiviranta et al. (2024) theorised in their research that the environments children explore should support their cognitive, emotional, social, and physical development, echoing classic principles found in the work of Rousseau and Pestalozzi. These ideas suggested that education should allow children to interact meaningfully with their surroundings, such as through experiences that reflect their interests, developmental needs, and cultural backgrounds (Lee, 2013). Though these philosophers and theorists were not specifically focused on physical spaces in ECE, their ideas inspired the future educators to think more intentionally about how physical environments in ECE could support active exploration and child-led learning.

The key shift towards an intentional approach to ECE spaces came with philosopher, Friedrich Froebel (1782-1852), who designed the first kindergartens in Germany, believed that children have unique needs and skills that should be nurtured and nourished like plants in a garden (Tovey, 2016). Froebel's kindergarten included outdoor gardens, open classrooms, and educational materials known as "Froebel's Gifts". As illustrated in Figure 1, the gifts included geometric objects such as balls, cubes, cylinders, and sticks, which encourage open-ended play and support holistic learning through interaction with the physical environment. Over time, Froebel's innovative ideas were found appealing by educational reformers across the world (Tovey, 2016). As these ideas gained popularity, they spread internationally, helping to establish a stronger connection between pedagogy and the design of early learning environments (Murray, 2018). Froebel's work laid the foundation for future educators such as Maria Montessori, Rudolf Steiner, Loris Malaguzzi, and many others who developed early learning environments that responded directly to theories of how children learn. For instance, Montessori's emphasis on independence and sensory learning, Steiner's focus on imagination and rhythm, and the Reggio Emilia approach, which values the environment as a central component of learning (Tovey, 2016).



Figure 1: Froebel's Gifts

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Following Froebel's foundational influence, early childhood education philosophies in the 20th century underwent significant transformation, particularly through the emergence of the Reggio Emilia approach, which reframed the environment as a central and intentional agent in children's learning (Thornton & Brunton, 2014). In the Reggio Emilia approach, the environment is reconceptualised from being functional to an environment that is aesthetically rich, thoughtfully designed, and responsive to children's interests and identities. As Vecchi (2010) notes, aesthetics in Reggio Emilia is not merely concerned with visual appeal but is deeply intertwined with ethics. The environment reflects a respect for children's capacities and encourages meaningful interactions with materials, people, and space. Through exposure to beauty and intentional design, children learn to value their environments, laying a foundation for empathy, ecological responsibility, and a strong sense of care and belonging.

In recent decades, ECE environments have undergone a notable transformation globally, with increasing emphasis on intentionally designed, child-centred spaces that support holistic development (Matthews & Lippman, 2019). Educational philosophies and theories such as Vygotsky's sociocultural theory, Bronfenbrenner's bioecological theory, Reggio Emilia approach, and play-based approaches have

contributed to these developments, arguing that the environment plays a significant role in fostering children’s exploration, creativity, and social interaction (Lee, 2013). Among the many countries influenced by these global ideas, Aotearoa New Zealand has embraced and adapted these concepts to shape environments where children can develop socially, emotionally, physically, and cognitively, as well as develop a strong sense of identity and belonging (Lee, 2013). The following sections trace how these ideas have taken root and have evolved within the New Zealand context, shaping the design and purpose of ECE environments over time.

2.3 A History of ECE Environments in Aotearoa New Zealand

In Aotearoa New Zealand, the design of ECE physical spaces reflects not only international educational philosophies but also the cultural knowledge of Māori ideas as the Tangata Whenua (people of the land) of this context. Before the introduction of formal European education models, tamariki (children) Māori in Aotearoa had an informal education, which was deeply connected with their daily life and nature-based learning experiences (Lee, 2013). Physical environments were open, flexible, and shifted between indoor and outdoor spaces, allowing children to explore, engage with nature, and learn through practical and culturally relevant experiences. This design reflected a holistic approach to education (Afrin & Bishop, 2023). These open and flexible learning settings were, however, interrupted by the arrival of European settlers and their formal education system, which had rigid classroom settings and standardised curricula. In response to these tensions, the evolution of ECE in Aotearoa gradually moved toward more child-centred approaches, influenced by both international philosophies and a growing recognition of the need to honour Māori ways of knowing and being within ECE environments.

2.3.1 Introduction of Child-centred ECE Environments in New Zealand



Figure 2: Indoor and Outdoor Environments

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The first New Zealand kindergarten was opened in Dunedin in 1889, heavily influenced by Froebel's kindergarten principles, emphasising the nurturing of young children through play, nature, and guided exploration (Howe, 2019). As in Figure 2, the design of early New Zealand learning spaces incorporated with nature-based outdoor spaces, open-plan classrooms with large windows for natural light and access to gardens, and child-sized learning materials, catered the developmental needs of children in mind (Alcock & Ritchie, 2018). Whilst Froebel's philosophical ideas provided a strong influence for the implementation of early kindergartens in New Zealand, they were also shaped by local educators and women's charitable organisations who were actively involved in providing ECE education and care services for children. These centres were mainly funded by the philanthropic and religious organisations, and notably the Free Kindergarten Union, which played a main role in expansion of ECE education before the state involvement in mid-20th century (May, 2002). These organisations funded for purpose-built, child-centred ECE environments in Aotearoa New Zealand. Figure 3 illustrates a typical early kindergarten setting from this period, highlighting the intentional layout and emphasis on children's autonomy and learning.



Figure 3: Typical early kindergarten setting

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By the mid-20th century, the types of ECE provisions available began to diversify with the emergence of the playcentre movement. Playcentres were parent-led and were cooperative learning settings, responding to both educational needs of young children and the changing roles of young women during and after World War 11 (May, 2002). During this time, progressive education philosophies such as John Dewey's ideas on learning by doing, the importance of free play, and the child as an active participant in their learning had begun to take root in New Zealand ECE (McLachlan, 2011).



Figure 4: Outdoor Environments

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From the 1950s to the 1970s, progressive education ideas became increasingly influential in early childhood education in Aotearoa New Zealand, as many teachers adopted child-led and play-based approaches in their practice.. As a result, physical environments in ECE centres also underwent major changes. For instance,

indoor spaces were open and adaptable, whilst outdoor environments included things that encouraged physical activities and interaction with nature (as illustrated in Figure 4). Both encouraged a variety of experiences from cognitive to social development (Maitland et al., 2020). Further, the flexibility and responsiveness of these spaces were designed to enable children to learn at their own pace and in ways that were meaningful to them.

Although, playcentres were built upon progressive principles and collaboration, parents also played an active role in planning and managing the learning environment. They designed the space, maintained the resources and facilitated learning in the centres, ensuring that the environments had evolved based on needs and values of their local communities.

By the end of 1970s, the ECE sector had widely accepted the notion that the environment plays a key role in children's development. These ideas prompted educators and architects to rethink the design of ECE settings, which have more spacious, better resources, and purposely organized materials around children's developmental needs.

2.3.2 Introduction of Te Whāriki and Physical Environments in ECE in Aotearoa New Zealand

The first ECE curriculum in New Zealand was introduced in 1996. The development of early childhood education (ECE) in Aotearoa New Zealand has been deeply influenced by the bicultural commitments established through the Treaty of Waitangi and strengthened by the Māori language and cultural revitalisation movement of the 1980s. Many considered this as a huge step towards creating pedagogies and learning environments that addressed not only the cultural background of children but also an active component in supporting development, wellbeing, and belonging (Lee, 2013).

According to the Treaty of Waitangi, the country's education system must respect and follow Māori values and their practices (Hargraves, 2022). The establishment of the Māori language and culture movement and the introduction of Kōhanga Reo in the early 1980s, highlighted the need for an education system that reflected Māori perspectives and the cultural identity of Māori children from infancy (Lee, 2013). Aligned with these movements, the Education Act of 1989 officially recognised ECE as a part of the whole education system and made it possible for *Te Whāriki: He whāriki matauranga mo nga mokopuna o Aotearoa. Early Childhood Curriculum* (Ministry of Education, 1996), to be conceptualised as a collaborative and bicultural curriculum (Ritchie, 1996).

2.4 Theoretical and Pedagogical Influences

As the country's first national curriculum for early childhood, *Te Whariki* (MoE, 1996) employed a range of educational theories and philosophies such as Bronfenbrenner's bioecological systems theory, Vygotsky's sociocultural theory, and drew upon the global pedagogical approaches such as Reggio Emilia

philosophy (McLeod, 2025). Bronfenbrenner emphasises that a child's development is shaped by multiple environments, from their immediate environments to wider societal influences (Brodie, 2024). Consequently, this theory supports the idea that ECE centres should provide rich, physical environments that make connections between children and their whānau, communities, and the world, which all play a meaningful part in children's learning ecosystems (McLachlan et al., 2018).

Similarly, sociocultural theory highlights the importance of social interaction, exploration, and shared experiences in learning and development (McLeod, 2025). In line with this theory, ECE environments are often designed with open spaces, flexible layouts, and shared learning areas that foster peer interaction, collaborative learning, and guided discovery (McLeod, 2025). Both bioecological systems theory and sociocultural theories support the design of open, collaborative learning spaces in ECE environments and position the environment as an active component in learning rather than a passive backdrop.

Further, the curriculum reflected the values of the progressive education movement, which had been present since the 1930s in New Zealand. With influence of the progressive movement, both the curriculum and the design of physical environments in ECE became more flexible, less teacher-centred, and placed greater emphasis on attention to children's interests. *Te Whāriki* (MoE, 1996) is deeply connected to the bicultural foundation of Aotearoa New Zealand, upholding the principles of the Treaty of Waitangi and Māori values, influencing both the curriculum content and the design of physical environments in ECE settings. For instance, the inclusion of whānau (family) spaces, native gardens, and the display of Māori arts, demonstrates value for Māori perspectives and identity (Probine, 2020).

At the same time, *Te Whāriki* (MoE, 1996) also reflected the influence of global pedagogical approaches such as the Reggio Emilia approach and the concept that the environment acts as a responsive teacher (Berti et al., 2019). Many ECE centres in New Zealand have been influenced by these ideas and have adopted elements such as natural lighting, open-ended materials, documentation walls, and flexible, aesthetic spaces that were designed to promote children's developmental needs (Berti et al., 2019). Together, these local and global influences demonstrate how the curriculum aspires to integrate its bicultural commitments with broader educational philosophies, contributing to the development of more inclusive, responsive, and empowering ECE environments.

2.5 The Influence of Te Whāriki Design and Principles on ECE Environments

Te Whāriki (MoE, 1996) known as “woven mat” in Māori (Lee, 2013), represents each child's development, including family, culture, language, and learning experiences. *Te Whāriki* (MoE, 1996) introduced a new way of thinking about young children's learning, emphasising how the physical environment can support development by encouraging educators and communities to create spaces that are flexible, inclusive, and

connected to local contexts (Maitland et al., 2020). The curriculum is built on four principles: empowerment (whakamana), holistic development (Kotahitanga), family and community (whānau tangata), and relationships (ngā hononga) (MoE, 1996). Each of these principles has implications for how physical environments in ECE settings should be conceptualised, designed, and utilised (Mitchell, 2018). For instance, the principle of empowerment encourages children to use the space freely by accessing resources independently and making choices in their play or work. This flexibility supports the creation of dynamic spaces where children are active decision-makers in the learning environment.

The principle of kotahitanga (MoE, 1996), recognises the interconnectedness of children's cognitive, physical, emotional, and spiritual development (Mitchell, 2018). In order to create a suitable environment for children to develop holistically, physical environments in ECE in New Zealand need to be designed to provide diverse opportunities to foster each of these dimensions. By providing quiet reading areas, sensory rich corners, spaces for active play, and art corners, the principle of kotahitanga emphasises that the design of physical environments needs to consider the whole child (Blaiklock, 2018). The principle of whānau tangata emphasises the idea that ECE environments should reflect and embrace the cultures and identities of children and their families (MoE, 2017). Creating welcoming spaces such as family corners, shared gardens, and communal meeting spaces that foster strong relationships between home and ECE centres (Tualaualelei & Taylor-Leech, 2020). Additionally, giving prominence to te reo Māori in ECE settings acknowledges the importance of New Zealand's bicultural heritage (Hargraves, 2022). Finally, the principle of Ngā hononga, highlights the central role of social interactions in supporting infants, toddlers, and young children's learning (MoE, 1996). By designing spaces with flexible seating arrangements, communal tables, and designated areas for group activities and discussions, the environmental design can play a crucial role in fostering social interactions and social-emotional development (Bedford, 2020).

Whilst *Te Whāriki* (MoE, 1996) weaves together both local and global educational philosophies, its bicultural foundation remains central. This bicultural orientation requires that the identities, values, and worldviews of Māori children are visibly reflected and honoured within the ECE environments. Consequently, the curriculum challenges ECE centres to represent the diverse cultural identities of children and their communities not only through the pedagogical practice but also the design and use of physical environments (Lee, 2013). Despite this intent, some factors hinder this aspiration, like limited cultural knowledge among educators, a lack of meaningful engagement with local iwi (tribes), and constraints within privately owned centres. Yet, addressing these challenges is vital. The next section aims to explore how privately owned centres, where commercial priorities may take priority, can impact on ECE physical environments and *Te Whāriki* (MoE, 1996) bicultural values.

2.5.1 Privatisation and Its Impact on ECE Physical Environments

During the period in between 1996 and 2017, New Zealand witnessed an increase in the number of privately owned ECE centres apart from the state run and charitable services due policy shifts that encouraged privatisation (Mitchell, 2019). With the introduction of neoliberal reforms, ECE was repositioned, not only as a public good but also as a market commodity. In 2007, the government introduced the 20 hours free ECE policy, where both public and private centres received funds (McLachlan et al., 2018). As a result, a significant number of newly established ECE centres emerged within the private sector, including those operated by large corporate entities. Although the policy aimed to improve accessibility, it also unintentionally stimulated the rapid growth of privately owned and corporate ECE services, which prioritised profit over pedagogical or environmental quality (Pairman, 2012).

As a result of this policy-driven expansion, privately owned centres began prioritising cost-efficiency over enriching and inclusive learning environments (Kearns & Ritchie, 2020). For instance, to reduce costs and increase enrolment, some centres were built with limited indoor and outdoor spaces with fewer natural materials (Kearns & Ritchie, 2020). As Pairman (2012) notes, corporate providers are often focused on maintaining low-cost ECE centres and designing spaces that meet only minimum regulations. Decisions about the physical design of many centres were driven more by bulk funding rather than prioritising what was best for children's learning. Further, the diversity and cultural richness of learning environments were impacted, mainly affecting Māori and Pasifika families, whose cultural needs were not always prioritised in cost-driven private settings (Mitchell, 2019).

Whilst *Te Whāriki* (MoE, 1996; 2017) highlights the importance of environments that are inclusive, empowering, and culturally responsive, it does not clearly address the risks brought by the privatisation of the ECE sector (Mitchell, 2019). For instance, because *Te Whāriki* allows for flexible interpretation, centres with varying financial capacities may implement the curriculum unevenly, resulting in significant disparities in quality. This can make it challenging for regulatory bodies to consistently monitor high standards across the sector (Kearns & Ritchie, 2020). As a result, some privately owned settings may focus on cost saving over providing fair, high-quality, and culturally respectful environments for young children in Aotearoa New Zealand.

2.5.2 The 2017 Refresh of Te Whāriki

In the decades following the release of *Te Whāriki* in 1996, the ECE landscape in Aotearoa New Zealand underwent a significant transformation. Rapid growth in the number and types of ECE provisions, increasing cultural diversity, and evolving educational priorities led to the decision to revisit and update the original curriculum. At the same time, new research into early childhood development, environmental education, and the influence of physical and social environments on learning prompted a deeper reflection

on how children grow, relate, and belong in the world (Kearns & Ritchie, 2020). In response to these shifts, the Ministry of Education released a revised version of *Te Whāriki* in 2017. Whilst both versions share a common vision and foundational principles, Ritchie (2018) asserts that the updated curriculum places a stronger emphasis on the role of place-based learning, sustainability, and the environment as an active contributor to children's holistic development. Further, Ritchie (2018) argues that these enhancements reflect a broader recognition of ecological responsibility within education, as *Te Whāriki* (MoE, 2017) acknowledges children's relationships with the natural world and their roles as kaitiaki (guardians) of the environment. The refreshed curriculum explicitly illustrates this commitment through multiple references to *kaitiakitanga* and environmental connection. For example, it states that "Kaiako encourage a sense of kaitiakitanga by providing children with regular opportunities to connect with the wider natural environment and materials drawn from nature" (MoE, 2017, p. 35). This integration of kaitiakitanga demonstrates how the curriculum's environmental values are embedded in the everyday physical and pedagogical environments of ECE settings, reflecting its broader commitment to inclusive and responsive spaces.

Further, the revised version of the curriculum explicitly notes that early childhood settings should be welcoming and inclusive, with spaces that reflect the identities and cultures of the young children who attend. The curriculum's four principles: empowerment, development, family and community, and relationships offer a clear framework for educators to continue to utilise indoor and outdoor spaces, creating flexibility to integrate children's culture and community in the physical design. For example, *Te Whāriki* (MoE, 2017) encourages including family photographs, bilingual signage, culturally significant artefacts, and children's creations to ensure the environment reflects the identities and backgrounds of all children.

Importantly, the updated curriculum (MoE, 2017) also addresses broader shifts, such as how teachers are expected to think about physical learning spaces (Chan, 2019). Rather than viewing the environment as a static or passive backdrop, Chan (2019) argues it is repositioned as an active and influential component of the learning process. The curriculum states that "an inclusive curriculum involves adapting environments and teaching approaches as necessary" (MoE 2017, p. 13). The newly introduced notion of the local curriculum provides the vision, space and flexibility for those involved in ECE to continually reshape understandings and interpretations of *Te Whāriki* (2017) to ensure that practices are adapted and respond to demographic changes" (p. 249). Within this framing, teachers are seen as intentional designers and co-constructors of space and experience, shaping environments that reflect and respond to the evolving interests, identities, and cultural contexts of children (Hearfield, 2024). Chan (2019) further confirms this idea by noting that teachers need to be purposeful in organising learning experiences and environments, actively responding to the interests, strengths, and cultural backgrounds of children and whānau. Teachers

must also be reflective and creative in how the layout, materials, and access to indoor and outdoor spaces can encourage young children’s agency, exploration, and wellbeing. Additionally, the revised curriculum places stronger emphasis on sustainability and ecological literacy, noting that “children learn through active exploration of the environment. They discover, affirm and extend their learning in settings that offer encouragement, warmth, and challenge” (MoE, 2017, p. 21).

Overall, the 2017 refresh of *Te Whāriki* reflects a deeper understanding of children as active participants in their environments and recognises the important role that space, culture, and sustainability play in learning and development. The curriculum aims to foster responsive, inclusive, and empowering practices by positioning teachers as intentional designers and positioning the environment as a dynamic contributor in development. This shift encourages ECE settings to create spaces that not only meet children’s developmental needs but also reflect their cultural identities and foster their sense of wellbeing and belonging. The next section explores how *Te Whāriki* (MoE, 2017) promotes ecological literacy and place-based pedagogy as essential components of ECE.

2.5.3 Ecological Literacy and Place-based Pedagogy

Te Whāriki (MoE, 2017) places a strong emphasis on ecological literacy and place-based pedagogy, recognising that children’s learning is deeply connected to the natural world and their relationship with it. The revised curriculum empowers teachers to develop a deeper sense of connection with the environment, the land, and the human world by integrating ecological literacy and place-based pedagogy through its principles, strands, and goals. Ecological literacy in ECE refers to children’s understanding of living systems, their interdependence with the environment, and the importance of sustainability (Hägström & Schmidt, 2020). This is crucial as *Te Whāriki* (MoE, 2017) is grounded in Māori worldviews, recognising their spiritual connections to land and place. As such, this encourages the development of an environmental identity for both children and teachers (Alcock & Ritchie, 2018) and highlights the importance of kaitiakitanga (guardianship) and the role of teachers in modelling and supporting sustainable practices. Further, place-based pedagogy, which is closely aligned with Māori concepts, emphasises the importance of children’s learning experiences within their local environments and cultural landscapes. Boyd (2019) points out that children can develop strong attachments to the places they live by encouraging exploration, care, and support for local ecosystems. For example, the mana whenua (belonging) strand states that early childhood settings should connect children to their place, land, and community exposure, natural outdoor spaces, and local environments is seen to enhance children's care for the environment as a part of their identity and responsibility (MoE, 2017). In doing so, the curriculum extends the learning environment beyond the ECE gates of settings, recognising the surrounding natural and cultural landscapes as key contributors to children's wellbeing, identity, and environmental awareness. In response to these ideas,

many ECE centres in Aotearoa New Zealand have included gardens, outdoor classrooms, and outdoor exploration programmes to reflect the place-based pedagogy and assist children in forming deep, meaningful connections with land and their communities (Boyd, 2019).

Since its creation, *Te Whāriki* (MoE, 1996) has provided a foundational framework that has influenced all aspects of ECE environments in Aotearoa New Zealand. The original curriculum recognised the environment as an important context for learning but largely treated it as a background for children’s play and exploration. For instance, it stated that “the early learning environment should provide opportunities for children to explore, experiment, plan, and make decisions within a safe, healthy, and stimulating setting” (MoE, 1996, p.43). As Ritchie (2018) notes, this version tended to treat the environment as a supportive context rather than an active participant in learning. The 2017 revision further developed the ideas about ECE environments by placing greater emphasis on sustainability, place-based pedagogy, and *kaitiakitanga* (guardianship), recognising the environment as an active, relational part of children’s learning and wellbeing. For example, *Te Whāriki* (MoE, 2017) states that “Kaiako encourage a sense of kaitiakitanga by providing children with regular opportunities to connect with the wider natural environment and materials drawn from nature” (p. 35) and that “diverse ways of being and knowing frame the way respect for the environment is demonstrated. Kaiako develop understandings of how children and their whānau make sense of the world and respect and appreciate the natural environment. Children may express their respect for the natural world in terms of respect for Papatūānuku, Ranginui and atua Māori. Kaitiakitanga is integral to this” (p. 46). Ritchie (2018) argues that the revised curriculum views the physical environment as a dynamic, relational, and co-constructed space that honours children’s identities, cultural backgrounds, and connections to place. Further, by integrating Māori knowledge and values, the curriculum emphasises the connection to land and environment (Boyd, 2019). The revised curriculum strengthens these ideas by giving more attention to the physical environments where children can experience these concepts.

2.6 Conclusion

The development of ECE environments over time reflects a complex interplay of global philosophies, cultural perspectives, and national policies. From the informal, community-based learning of early societies to the influence on pedagogical approaches from theorists such as Froebel, Montessori, and Malaguzzi, the physical design of ECE spaces has progressively shifted towards supporting children’s autonomy, exploration, and holistic development. In Aotearoa New Zealand, these global influences have been uniquely interwoven with Māori educational values and practices, resulting in environments that strive to be inclusive, culturally affirming, and grounded in te reo Māori and tikanga Māori.

The introduction of *Te Whāriki* in 1996 marked a pivotal moment in this evolution, encouraging child-centred and culturally responsive approaches to space and learning. The 2017 refresh further emphasised

the importance of environments, particularly in relation to outdoor learning, sustainability, and ecological literacy. However, the privatisation of the ECE sector has created tensions between economic efficiency and pedagogical quality. Market-driven models can challenge the capacity for ECE teachers to create enriching physical environments, raising critical questions about equity, cultural responsiveness, and children's right to quality learning spaces.

Despite these challenges, *Te Whāriki* (MoE, 2017) remains a powerful guiding framework, inspiring educators to design environments that are not only functional but also reflective of children's identities, rights, and relationships with the natural and social worlds. As this chapter has shown, the design and use of physical environments in ECE are far more than aesthetic or logistical choices. They are deeply connected to the broader educational, cultural, and political contexts that shape early learning in Aotearoa. The following chapter examines how contextual factors, including types of ECE provision, policies, design principles, and underlying theories, influence the practical design of ECE environments today.

CHAPTER 3

UNDERSTANDING PHYSICAL DESIGN IN EARLY CHILDHOOD EDUCATION (ECE)

3.1 Introduction

The physical environment in ECE plays an integral role in shaping children's learning, development, and wellbeing. It functions as a dynamic and responsive element that has the potential to support children's autonomy, foster relationships, and enrich children's cultural identities and everyday experiences. In Aotearoa New Zealand, where ECE is guided by its bicultural curriculum and the principle of Kotahitanga (holistic development), the physical environment becomes an active contributor, shaping children's development, wellbeing, and belonging (MoE, 2017). This chapter explores what constitutes physical design in ECE and investigates the range of factors that shape the environments in which young children experience ECE. These factors include provision type, regulatory frameworks, theories and philosophies, and design principles and spatial thinking. In addressing these areas, the chapter responds to the third sub-question of the research, which examines the foundational frameworks that inform how ECE environments are conceptualised and developed.

Whilst licensing criteria and regulatory frameworks establish minimum safety and spatial standards, it is the pedagogical philosophies, cultural values, and design principles that transform these spaces into meaningful learning environments. Further, physical environments are also influenced by broader socio-political forces, including commercialisation, equity of access, and the cultural responsiveness of ECE settings in Aotearoa (Group et al., 2020). By examining these influences, this chapter offers a comprehensive understanding of how ECE spaces can be designed to support the aspirations of *Te Whāriki* (MoE, 2017) and international benchmarks such as the OECD goals for inclusive, high-quality early learning.

The chapter begins by defining what physical design in ECE includes and how it can impact children's holistic development, wellbeing, and belonging. It then explores the types of provisions, highlighting how each type interprets and implements physical design according to their values and operational structures. Next it moves into analysis of how philosophical and theoretical ideas such as Vygotsky's sociocultural theory, Bronfenbrenner's bioecological system theory, Reggio Emilia approach, and play-based pedagogies influence the spatial design of ECE environments. *Te Whāriki* (MoE, 2017) as a values-based curriculum, is also examined, with consideration of how its principles shape physical design across various settings. Lastly, design principles and spatial thinking are explored, with a focus on how each principle contributes to children's development, wellbeing, and learning. The chapter ends with a synthesis and critical reflection on these ideas, presenting a conceptual model that illustrates how all these factors interconnect to influence

physical design in ECE. It also examines the tensions that arise due to commercial standardisation, spatial inequities, and policy gaps, and further recommending pathways for achieving equitable, empowering environments that align well with the curriculum and global quality requirements. Ultimately, it emphasises that physical design is not static but must remain dynamic and responsive to the diverse identities, needs, and rights of young children and their families.

3.2 What is Physical Design in ECE?

The arrangement of walls, furniture, and learning materials play a crucial role in shaping an environment where children feel safe, inspired, and supported (Group et al., 2020). As young children approach learning using all of their senses to interact with their surroundings, the design of the physical environment can significantly shape their development not only physically, but also socially, emotionally, and spiritually (Probine, 2020). A well-designed physical environment in ECE settings enables children to see themselves reflected in the space, engage meaningfully with others, and find opportunities for exploration, play, and comfort (Matthews & Lippman, 2019). Therefore, design becomes a form of communication and care, where every element of indoor and outdoor areas influences children's experiences in different ways (Little, 2020).

There are many different understandings about how and what should influence the physical design in ECE centres. For example, Bollig and Millei (2018), in their study across European ECE settings argued that the design of ECE spaces should reflect beliefs about what childhood should be, what children need, and how they ought to be socialised. Similarly, Slunjski (2014), in her conceptual review on ECE space design, asserts that spaces should foster children's autonomy, exploration, and encourage self-organisation through their daily activities. Further, Slunjski (2014) believes that physical designs must be diverse and responsive, adapting to child's developmental stages and cultural backgrounds, highlighting the importance of designing spaces that are both developmentally appropriate and culturally inclusive. In contrast, studies by Genet (2023) and Wake and Eames (2013), extend the understanding of the physical environment by proposing that ECE design should be regenerative, place-based, and ecologically immerse, enabling children to grow as environmentally responsible individuals. These views collectively support the argument that the design of physical environments acts as a silent curriculum, significantly shaping children's holistic development, wellbeing, and sense of belonging.

Whilst the significance of thoughtfully designed physical environments in ECE is widely recognised for its supporting role in children's holistic development, wellbeing and sense of belonging, it is important to understand design does not exist in isolation. Instead, the design of physical environments is impacted by a range of interconnected factors that influence how spaces are perceived, constructed, and experienced. Further, their design is shaped by a complex interplay of institutional values, operational structures, and

broader policy frameworks. The next section begins by exploring how different types of ECE provision influence design priorities and spatial possibilities.

3.3 Type of Provision and Implication for Design

Pairman (2012) argues that the “description and naming of services within the ECE sector is complex” (p. 29). The services in ECE in Aotearoa are diverse, based on values, philosophies, and operational frameworks. According to the Ministry of Education (2025), ECE provision types can be broadly categorised into teacher-led, and parent-led. Teacher-led services include education and care services, kindergartens, and home-based services, where qualified teachers are central in supporting children’s learning and development. In contrast, parent-led services, such as playgroups, Playcentres, Ngā Kōhanga Reo, and Pacific Language Nests, position the community and whānau as central to children’s learning and development. All these provisions are influenced by the values and purposes of that provision, which in turn shape the design and organisation of the physical environment, impacting children’s holistic development, wellbeing, and sense of belonging.

3.3.1 Teacher-led ECE Services

In Aotearoa New Zealand, teacher-led services such as education and care centres, kindergartens, and home-based settings play a central role in the ECE sector, with many privately owned and operated. These services are licensed and regulated, and require qualified teachers to implement the curriculum, *Te Whāriki* (MoE, 2017). Education and care centres provide care for children aged from birth to school age, offering full or part-day sessions. The design of the physical settings of these centres are also carefully constructed and maintained to support children’s holistic development, wellbeing, and sense of belonging. However, the nature and quality of these environments vary significantly particularly within the privately owned sector. Privately owned services range from small, individually owned centres operating out of repurposed residential or commercial buildings, to large corporate franchises with greater financial capacity to develop purpose built, architecturally designed spaces.

Pedagogically, these centres promote learning through play, exploration, and social interaction, specially guided by the qualified teachers. The environments in kindergartens are often purpose-built spaces, featuring large outdoor areas and clearly defined learning zones that support autonomy, collaboration, and holistic development (Alcock & Ritchie, 2018). As Pairman (2012) notes, these environments are more aligned with the principles of *Te Whāriki* (MoE, 2017) principles, catering to physical, emotional, cognitive, and spiritual domains through diverse play options.

Home-based services provide education and care for small groups of young children in a home setting. Home-based services gained official recognition as an ECE service in the late 1980s and were gradually

integrated into the formal education sector (Ministry of Education, 2023). In a home-based service, a trained carer provides education and care for a small group of children (usually up to four) in their own home. These services are monitored by a qualified coordinator, ensuring that the carers follow the curriculum, health, and safety requirements (MoE, 2015). These settings emphasise small group care, individualised attention, and integration of daily life and local community into learning through the physical environment.

3.3.2 Parent-led ECE Services

The physical environments of parent-led settings are often designed and constructed by families and communities, reflecting specific cultural values, collective purpose, as well as a commitment to the principles of *Te Whāriki* (MoE, 2017).

Playgroups are informal, community-based gatherings where parents and caregivers bring children together to play (MoE, 2023). These services often operate in shared spaces such as community halls or church premises. The physical environments of these centres temporary and adaptable, basically relying on portable resources and flexible layouts to encourage social interactions, exploration, and relationship building. Playcentres are unique to the New Zealand context and operate by parents and the family, who are also guided by *Te Whāriki* (MoE, 2017). Playcentres are government funded, and parents are trained as primary educators for children (MoE, 2023). Similar to teacher-led settings, the physical environment of a playcentre is purposefully designed. Playcentres value open-ended play, independence, and collaboration (Adlerstein & Cortázar, 2022). Consequently, spaces are divided into areas for children to get engaged such as art, carpentry, music, and dramatic play, with a strong emphasis on child-led activities, supporting exploration and holistic development (Adlerstein & Cortázar, 2022).

Te Kōhanga Reo (language nests) are Māori early childhood services are operated by whānau and qualified teachers and guided by Kaupapa Māori. The physical environment of these settings is deeply influenced by Māori customs and values (Ulfah, 2025). The setting up and maintenance of the environment is a shared responsibility often led by of whānau rather than individual educators. Based on the values of Te Kōhanga Reo, indoor spaces are warm and homelike, including open communal areas where children, teachers, and staff to gather and uphold the collective learning practices central to Māori education (Hargraves, 2022). Outdoor spaces include gardens, natural play materials, and culturally significant plants, reflecting the Māori relationship with Papatūānuku (the earth mother), providing children with opportunities for exploration, responsibility, and environmental stewardship (Hargraves, 2022).

Similarly, Pacific Nests aim to preserve and revitalise Pacific languages and cultures through early learning. These settings are often located in community churches or halls. Pacific artefacts, for example, tapa cloths and musical instruments are often design features of these environments to reflect an emphasis on cultural

authenticity and intergenerational knowledge (Hargraves, 2022). These practices uphold *Te Whāriki* (MoE, 2017) principles of belonging, identity, and communication.

While each ECE provision in Aotearoa New Zealand brings unique strengths to the design and use of physical environments, there are also notable challenges. In teacher-led services, particularly in education and care services, rapid growth and increasing privatisation can limit the quality and intentionality of physical design. For instance, ECE centres which are operated by large commercial chains may adopt a cookie-cutter model, where cost effective, prefabricated architectural plans are replicated across multiple sites to reduce expenditure (Mitchell, 2019). Similarly, May (2019), argues larger chains and franchises may prioritise operational efficiency over pedagogical richness, resulting lack of spatial flexibility, cultural responsiveness, and authentic materials in their physical environments.

The homely physical environment in home-based ECE services may vary widely depending on individual providers. Further, these services often have fewer facilities and resources than centre-based services, which can limit the variety and richness of educational activities such as lack of large open areas, insufficient shade, and limited natural materials can restrict children's engagement with nature and physical activity (Alexander, 2021). Similarly, parent-led services such as playcentres and language nests may face challenges due to limited funding, access to resources, and reliance on voluntary staff (Hargraves, 2022). Although these environments may meet licensing requirements, they may find difficult to offer transformative and inquiry-rich spaces proposed by philosophies such as the play based- approaches promoted in *Te Whāriki* (MoE, 2017). To understand these constraints more fully, it is necessary to explore the role of regulations and spatial standards in shaping ECE environments.

3.4 Regulatory Frameworks and Spatial Standards

The design of ECE environments in Aotearoa is governed by a set of licensing criteria and regulatory frameworks such as Education (Early Childhood Services) Regulations 2008, the associated Licensing Criteria 2008 for various service types, and the Education and Training Act 2020 which superseded the Education Act 1989. All these documents outline the legal and operational requirements that all licensed services must follow, including regulated elements such as minimum space per child (indoor and outdoor), safety, visibility, and educator qualifications. Further, these elements of the physical design of ECE environments are monitored and evaluated by the Education Review Office (ERO) and the Ministry of Education (MoE).

3.4.1 Space Requirements: Indoor and Outdoor Design Standards

Physical spaces in ECE refer to the physical areas both indoor and outdoor where children play, learn, and interact. The Licensing Criteria for Centre Based Services (2008) recommend that each child must have a

minimum of 2.5 square metres of indoor space and 5 square metres of outdoor space (Education Review Office, 2020), ensuring that children have sufficient room for movement, exploration, and learning. Teacher-led services such as kindergartens and education and care centres must meet or exceed these requirements, particularly when purpose-built environments are involved. According to Licensing Criteria for Home-Based Education & Care Services 2008 and Early Childhood Education Curriculum Framework (2022), home-based services must provide at least 10 square metres of indoor space per children. A safe place for infants to sleep, hygienic nappy changing areas, and food preparation areas are also essential in these services.

Additionally, all centre-based services are required to have outdoor environments that are easily accessible from the indoor spaces, and should be available daily (MoE, 2022). For example, many education and care centres design their layouts to allow seamless indoor-outdoor flow, enabling spontaneous play and reducing transitions that can disrupt learning. Parent-led services, especially Kōhanga Reo and Pacific Language Nests, also place strong emphasis on outdoor environments that reflect cultural values, such as gardens with native plants and open communal areas (Hargraves, 2022). Home-based services must either provide outdoor play space or have safe, regular access to a nearby park (MoE, 2022).

3.4.2 Visibility and Safety: Enabling Supervision and Protection

According to Licensing Criteria 2008 (MoE, 2022), settings should have visibility across spaces, allowing for constant supervision of children. Most of the time, teacher-led services plan their environments through open plan designs, use of low furniture, and clear sight lines between different activity areas. For instance, infant sleeping areas are often equipped with viewing panels. Parent-led services often have high adult to child ratios, allowing multiple adults to supervise the small group. Similarly, home-based carers must demonstrate that children are easily visible and able to supervise the children always (ERO, 2020). Further, to ensure the outdoor safety, play areas must be enclosed by fences or barriers, which are supposed to be at least 1.2 -1.5 metres tall with self-closing gates (MoE, 2025).

3.4.3 Educator Qualifications

There are regulations regarding the qualifications that teachers must hold across different types of provision.. Teacher-led services are required to employ qualified teachers to implement the ECE curriculum. As per the Ministry of Education (2022), at least 50% of required staff must be fully qualified ECE teachers. When it comes to home-based services, educators should or be working towards a Level 4 ECE qualification with the supervision of visiting teachers. These regulatory standards ensure that the physical environment is not only safe and meets minimum requirements but is also shaped by professionals with the theoretical and pedagogical knowledge that will allow them to make informed design decisions that support children’s holistic development and daily experiences.

3.4.4 Critical Issues

Although regulatory frameworks, and spatial standards are aimed to create high quality ECE settings, significant tensions can be identified when it comes to practice. In New Zealand the minimum provision of 2.5 m² indoor space per child (about 5 m² outdoors for centre-based services) (ERO,2020) falls behind of international recommendations. According to OECD reports it should be approximately 2.9 m² indoors and 7–8.9 m² outdoors. Pairman (2012) asserts this as a “blind spot” in New Zealand policy. Nearly a decade after this assertion, this issue remains unchanged. As Mitchell (2019) notes, inequities driven by funding further exacerbate this issue. For instance, well-resourced private centres may be able to build environments according to standards whilst community-based services in low socio-economic areas may struggle to merely to comply with standards. These shortcomings not only affect UNESCO’s right to education framework and OECD equity goals but also the children’s development and experiences.

Licensing criteria and regulations provide essential safeguards and minimum quality standards; however, they do not fully respond to the importance of creating a rich and responsible physical learning environment. The foundational structures established by these regulations are necessary to ensure all children have access to safe spaces where they can develop and be adequately supervised.

3.5 Educational Philosophies and Theoretical Underpinnings

Early childhood environments in Aotearoa New Zealand are not just merely spaces, they are reflections of philosophical, cultural, and theoretical foundations underpinning each provision. Research affirms that the design, layout, and environment of ECE significantly impact the children’s learning and development (Matthews & Lippman, 2019). This section explores how foundational philosophies, and pedagogical theories can shape the design of physical environments in ECE settings, and how these environments may represent the aims and values of *Te Whāriki* (MoE, 2017).

Among the various theoretical frameworks that inform the design of physical environments in ECE in Aotearoa New Zealand, Vygotsky’s sociocultural theory and Bronfenbrenner’s bioecological systems theory have been particularly influential. Sociocultural theory emphasises that human development is a social and cultural process and learning occurs in relationships with people, places, and things, and is influenced by involvement in social and cultural activities that are valued by those around them, including the physical environment (McLeod, 2025). Here, the term “culture” means more than ethnicity. It refers to all the values, understandings, and practices associated with all the contexts children experience (Bernard, 2024). In response to these ideas, environments should be designed to encourage social interaction, cooperative play, and shared activities, encouraging the idea that cognitive development is facilitated by participation in valued social and cultural activities. For instance, purpose-built physical spaces often symbolise these values by designing spaces to support play, natural materials, and zones for different

domains of development (McLeod, 2025). The physical environments of these services are designed not only to support learning outcomes but also to represent cultural practices, intergenerational knowledge-sharing, and community connectedness (Lee, 2013). Sociocultural theory explains how physical environments act as socially and culturally embedded spaces that support children's learning and development through relationships and shared practices (Ritchie, 2010). Bronfenbrenner's bioecological theory positions environments within broader, interconnected layers of influence that shape children's development (Brodie, 2024). This theory offers a multilayered understanding of child development by positioning the child in the immediate microsystem (home setting, or ECE setting) to the broader macrosystem (cultural values and policies) (Brodie, 2024). In other words, this theory highlights the importance of consistency between children's home environments and their early childhood settings. Within the microsystem, physical elements such as spatial layout, lighting, and acoustics directly influence how children engage, feel, and learn. At the mesosystem level, which encompasses the interactions and relationships between two or more microsystems (the home and the ECE settings), culturally responsive design, such as shared entranceways, whānau rooms, or spaces enriched with cultural artefacts, reinforces the connection between home and centre. In this way the theory highlights that children's experiences are shaped by the physical space of the child's environment (Brodie, 2024).

Both Vygotsky and Bronfenbrenner's theories underscore that the environment is not neutral but relational that it mediates children's experiences, influences their interactions, and shapes their identities. In ECE settings, these ideas are reflected through spaces which are intentionally designed to support these relational dimensions through small-group areas, quiet zones, and rich sensory experiences (Brodie, 2024).

3.5.1 Reggio Emilia Approach: The Environment as the “Third Teacher”

According to Loris Malaguzzi children learn from three primary sources: adults (parents and teachers), other children (peers), and the environment itself (Gantt, 2021). This last element, the environment, is conceptualised in the Reggio Emilia approach as the “third teacher”, highlighting its powerful pedagogical function. Robson (2017) argues that when a space is set up optimally, it facilitates and empowers children as they navigate this open-ended exploration of things that interest them. In this approach children are seen as partners and collaborators in their own learning and development, and the environment is valued for how it stimulates, provokes and facilitates this process which providing space for children to lead their own learning.

In Aotearoa New Zealand, the Reggio Emilia approach has had a significant influence on ECE, especially in teacher-led centres that value inquiry-based and arts-rich curricula (Probine, 2020). Reggio-inspired centres commonly feature natural light, transparent walls, documentation panels, and open-ended materials arranged in aesthetically pleasing ways (Robson, 2017). These design choices encourage collaboration,

independent thinking, and a strong sense of belonging among children. It is ever evolving, in response to children's needs and inquiries, making children feel ownership over their environment and foster continuity in learning (Robson, 2017). These design practices reflect how the Reggio Emilia approach has been interpreted within the New Zealand context and how these physical spaces influence children's experiences developmentally, culturally, and emotionally.

3.5.2 Play-based Philosophy and the Physical Environment

Play-based learning plays a significant learning role in ECE and is deeply valued within *Te Whāriki* (MoE, 2017). The philosophy emphasises that through play, children develop social relationships, emotional balance, cognitive abilities, and a sense of identity (Hunter, 2019). In response, physical environments in play-based settings are purposefully designed to be flexible, responsive, and rich in materials, inviting imagination, creativity, and exploration. According to McArdle (2024), environments in settings where play is valued become co-constructive spaces where learning and development are shaped through culturally meaningful activities such as storytelling, pretend play, music, and engagement with natural materials that reflect children's interest, backgrounds, and the values of their communities.

In ECE centres, play-based philosophy is often reflected in large outdoor areas featuring sandpits, climbing structures, gardens, and natural materials, fostering gross motor skills and a connection to the natural world (Little, 2020). Indoor environments are typically arranged into zones for dramatic play, construction, music, art, and literacy. These affordances offer rich sensory, cognitive, and emotional experiences, directly addressing the first sub-question of this study regarding how specific environmental elements support holistic development (Little, 2020). Parent-led services, such as Playcentres, exemplify the play-based approach through spaces that are divided into learning areas such as music, carpentry, and imaginative play. However, these spaces are not static, but are regularly adapted to reflect children's evolving interests, supporting children's autonomy, creativity, and empowerment.

Further, play-based environments are not incidental but intentionally designed in ways that reflect sociocultural values and respond to children's developmental needs. They affirm the vision of *Te Whāriki* (MoE, 2017), which views children as confident, competent learners and communicators, connected to their world and secure in their sense of belonging. Through thoughtfully designed spaces that encourage inquiry, creativity, and social interaction, play-based environments in New Zealand ECE settings play a vital role in shaping children's learning experiences and wellbeing.

3.5.3 Critical Issues

However, applying these theories and philosophies to the design of ECE environments present several challenges and limitations. Foundational theories such as sociocultural theory, bioecological theory, and

Reggio Emilia approach, offer broad conceptual guidance rather than design instructions, making practical implementation complex and inconsistent (Stewart et al., 2024). Furthermore, Evans et al. (2022) point out that balancing Western philosophies with indigenous views can result in misunderstandings if they are not handled with sensitivity. Additionally, practical pressures such as limited funding, space, and regulatory requirements restrict the ability to fully realise theoretically informed environments (Group et al., 2020). Regulatory frameworks may also impose strict safety and licensing standards that limit flexibility, making it difficult to create risk-rich, open, or communal spaces that some philosophies promote (Stewart et al., 2024). Therefore, whilst educational theories provide essential frameworks for designing environments, their successful translation into ECE environments requires culturally responsive interpretation, adequate resourcing, and flexible regulatory support to ensure that spaces genuinely reflect and serve the diverse needs of all children.

3.5.4 *Te Whāriki* as a Value-based Curriculum Shaping Physical Design

Te Whāriki (MoE, 2017), New Zealand's bicultural curriculum is strongly value-based and shapes both the pedagogy and the environment in ECE services. The curriculum's four foundational principles inform how physical environments are designed and guide educators to create environments where every child can thrive as a confident and connected learner. Many centres respond to local identity through integrating natural materials, Māori and Pacifica artefacts, bilingual signage, and displays of children's whānau, promoting children's sense of belonging and identity (Lee, 2013). These design decisions are directly aligned with the curriculum's emphasis on supporting young children's wellbeing and holistic development, and demonstrate how curriculum values can be translated into environmental design across diverse provision types, from teacher-led to parent-led services. Moreover, *Te Whāriki* (M0E, 2017) promotes environments that nurture agency, collaboration, and exploration, all which shape how children experience ECE holistically. This is further reinforced by Education Review Office (2020) which emphasises that environments should promote agency allow children to make independent choices and engage in self-directed play. For instance, the use of low-level shelving, mobile furniture, and accessible learning materials empowers young children to initiate their own activities as expected by the curriculum. Further, ERO (2020) points out that high-quality environments enable children's to make decisions and foster independence which are positively correlated with children's wellbeing. This is particularly evident in services where Reggio-inspired practice results in the inclusion of documentation panels, transparent walls, and natural light to invite inquiry and dialogue (Slunjski, 2014b). These features not only encourage collaboration among peers but also support a calm, predictable atmosphere that enhances emotional regulation and holistic development in young children.

3.5.5 Ecological Literacy and Place-based Pedagogy in Physical Design

The 2017 revision of *Te Whāriki* (MoE, 2017) incorporates ecological literacy and place-based pedagogy as foundational aspects of children's early learning experiences. The curriculum's principles guide services to create environments that respond to these ideals, for example, intentionally planting native species, and including water elements that mirror local ecosystems. Inclusion of such features fosters daily opportunities for children to engage with nature in a meaningful way. By embedding ecological literacy and place-based pedagogy into physical design, *Te Whāriki* (MoE, 2017) reinforces the curriculum's role in cultivating environmentally responsible, culturally grounded learners from an early age.

Further, building on Bronfenbrenner's bioecological systems theory, recent educational research highlights the significance of ecological literacy and place-based pedagogy as essential elements to be reflected in ECE environments. Ecological literacy focuses on fostering children's understanding of environmental systems, aligning with the ecological and cultural systems identified in Bronfenbrenner's macrosystem. Place-based pedagogy complements this by situating learning within local contexts, connecting children with the natural landscapes specific to their environment (Häggström & Schmidt, 2020). Furthermore, play-based philosophy in ECE interconnects with ecological literacy and place-based pedagogy through its strong focus on outdoor learning and nature play. As Häggström and Schmidt (2020) note, when children engage in natural settings, they not only develop physical skills but also cultivate an awareness of environmental interdependence. This aligns with the goals of ecological literacy, fostering children's understanding of sustainability and their role as caretakers of their environment. In New Zealand's diverse ECE settings, this means designing environments that reflect local ecosystems, incorporate native flora and fauna, and embed environmental stewardship as part of everyday play experiences. Such practices ensure that learning is contextually grounded, supporting children's cognitive, emotional, and cultural development through authentic engagement with place.

3.5.6 Critical Issues

Although *Te Whāriki* (MoE, 2017) provides a holistic, bicultural, and principle-based framework that outlines broad goals for children's learning and wellbeing, Lee (2013) argues that limited concrete guidance for physical design is offered, making the translation of these principles into everyday environments highly variable across centres. Shuker and Cherrington (2016) affirm that this lack of direction can lead to environments that reflect only minimum regulatory standards, rather than the relational, culturally responsive, and exploratory spaces intended by the curriculum. Further, the curriculum highlights the importance of culture, belonging, and working with families. However, many centres struggle to reflect these values clearly in their environments, especially when it comes to including authentic Māori and Pasifika perspectives. Sometimes these cultural elements appear only in surface-level ways, rather than

being deeply woven into the space (Lee, 2013). As Slunjski (2014b) notes, not all teachers have the same level of knowledge or training to design environments that reflect the vision of Te Whāriki (MoE, 2017).. As a result, the way the curriculum is reflected in physical environments can vary widely. Overcoming these challenges requires teamwork, reflection, and a real commitment to cultural respect and good teaching practices that fit each ECE centre's unique community.

As a value-based curriculum, *Te Whāriki* (M0E, 2017), plays a significant role in shaping the design of physical environments of ECE settings across Aotearoa. Its foundational principles are made visible in the design of spaces that are culturally inclusive, emotionally responsive, and pedagogically purposeful. As ERO (2020) highlights, purposefully built high-quality ECE services can result in environments that enable independence, wellbeing, and reflect the identities of the children and communities they serve. These spaces have a direct influence how they are organised, adapted over time, and experienced by children. In the following section, design principles and spatial thinking that underpin the creation of effective and responsive early childhood environments are examined.

3.6 Design Principles and Spatial Thinking

Originating in the field of architecture, design principles and spatial thinking provide a conceptual foundation for how physical spaces are intentionally shaped and organised. When applying these ideas into ECE, they inform how learning spaces are created and arranged to support young children's development, learning, and wellbeing. Design principles include the foundational guidelines and considerations that shape how learning spaces are organized, furnished, and maintained (Adlerstein & Cortazar, 2022). These principles guide decisions about spatial arrangement, aesthetics, safety, accessibility, and the selection of materials and furniture. Spatial thinking refers to the intentional organisation of learning environments that support children's holistic development and influence their experiences of agency, wellbeing, and belonging (Gregg, 2021). Research indicates that thoughtful spatial design can foster independence, stimulate creativity, and encourage meaningful social interactions (Konda & Dong, 2023). Consequently, this section examines key architectural design principles related to ECE including flow and visibility, aesthetic coherence, access to nature, spatial diversity, and cultural responsiveness, and how they are interpreted across types of ECE provisions.

3.6.1 Flow and Visibility

Flow and visibility, which are known as core principles in ECE design, significantly shape children's experiences, autonomy, and wellbeing. Flow refers to the ease with which children and adults can move through the environment, whilst visibility refers clear sightlines for supervision and engagement. Both are fundamental to spatial reasoning, as they allow children to develop mental maps of their surroundings, understand spatial relationships, and navigate routes within the space (Gregg, 2021). A space with good

flow enables children to transition smoothly between indoor and outdoor areas, or between activity zones. Visibility lets teachers to supervise children and lets the children to see their peers and teachers, which makes them feel safe and connected to others.

According to Fardlillah and Suryono (2019) a well-arranged physical environment in ECE should provide enough spaces so that children can move freely and recommend avoiding excessive physical barriers to promote a sense of belonging and freedom. From a spatial thinking perspective, these physical arrangements facilitate both autonomy and positive interaction, encouraging children to manage their own activity choices under teachers' observations. Additionally, dividing spaces into different zones like active zones, messy zones, and quiet zones support different learning modes and behaviours, underscoring how spatial flow directly supports child development through various experiences (Fardlillah & Suryono, 2019).

ECE settings that have open-plan layouts often use transparent partitions and low height furniture to ensure both visibility and autonomy (Slunjski, 2014b). In contrast, settings in repurposed buildings may need to rely on high adult-to-child ratios to achieve natural visibility and dynamic flow in the settings. However, these fundamental principles, flow and visibility are not just architectural principles. They are purpose tools that help to shape children's holistic development and sense of belonging. As Fardlillah and Suryono (2019) argues, when educators actively structure physical spaces with attention to openness, safety, and flexibility, they create environments that nurture both learning and wellbeing by encouraging exploration, reducing stress, supporting autonomy, and fostering positive social interactions.

3.6.2 Aesthetic Coherence and Atmosphere

Research shows that ECE settings with aesthetic coherence and nurturing atmosphere, play a significant role in children's wellbeing, behaviour, and engagement. Aesthetic coherence in ECE refers to a visually and thematically cohesive environments that have a sense of order, beauty, and unity in the designs (Slunjski, 2014b). Aesthetic coherence in the physical environment is more than just décor; it communicates with children, giving them messages and cues about how to play, act, and engage in learning spaces. It helps the environment more like to be a "third teacher", assisting children through its layout and appearance (Terreni, 2019).

In a well-designed space, aesthetic coherence is achieved through the thoughtful use of colour, texture, lighting, and materials, bringing an environment that is harmonious, meaningful, and emotionally supportive for both children and teachers (Konda & Dong, 2023). The atmosphere builds on this idea by encompassing the overall emotional tone of a space, contributing to children's sense of calm, safety, and engagement. Spatial thinking plays a crucial role here, as teachers intentionally design environments that communicate care, respect, and belonging through spatial organisation and sensory cues. For instance,

Pinciotti et al. (2013) points out that spaces which are clutter free, well-lit with natural light, and that include natural materials (wood or plants), tend to promote concentration and emotional wellbeing, reflecting the environments that grounded in warmth, attentiveness, and inclusion.

Aesthetic coherence is clear in teacher-led services such as education and care centres through soft, neutral colour palettes, comfortable furnishings, strategically placed child displayed work, and documentation panels that give value to children’s learning and developmental journey (Konda & Dong, 2023). However, aesthetic coherence is not about uniform design standards, but rather, about creating meaningful, emotionally resonant spaces. When thoughtfully applied, aesthetic coherence supports spatial legibility, emotional wellbeing, and children’s sense of belonging and identity, ensuring the environment is both pedagogically rich and personally affirming.

3.6.3 Access to Nature

Nature-rich environments provide a multisensory, dynamic setting where children engage in authentic, open-ended play and inquiry (Alcock & Ritchie, 2018). Gardens, trees, water features and sandpits invite children to explore, experiment, and create. These features are identified and included in high-quality ECE environments, recognising its deep impact on children’s holistic development, wellbeing, and sense of belonging (Ahi, 2021). The importance of access to nature is strongly embedded in *Te Whāriki* (MoE, 2017) stating that “kaiako recognise the relationship mokopuna have with the environment. They support them to fulfil their responsibilities as kaitiaki of the environment. For example, kaiako encourage mokopuna to observe nature without harming it” (p. 48). This reflects the curriculum’s emphasis on fostering children’s ecological awareness, respect for the natural world, and commitment to sustainable practices from the earliest years.

From a spatial thinking perspective, access to nature is more than having an outdoor area, it is about how the environment is designed to facilitate children’s exploration, autonomy, and connection. In a well-designed ECE setting, seamless indoor and outdoor flow enables children to move freely between spaces and choose where and how they engage with the natural world (Kiviranta et al., 2024). Elements such as large sliding doors, covered decks, and visual continuity between indoor and outdoor areas, encourage children to initiate their own explorations and return indoors as needed (Kiviranta et al., 2024). Further, outdoor spaces should include a variety of zones such as open lawns, shaded groves, vegetable and fruit gardens, and water play areas, offering opportunities to play, learn, and grow. These zones develop children’s spatial reasoning and to understand spatial relationships (Alcock & Ritchie, 2018). The use of natural landmarks and loose parts further encourages children to create their own structures and pathways, further developing their spatial and problem-solving skills.

Purpose-built settings should maintain well-designed outdoor areas with climbing structures, gardens, and water structures (MoE, 2025). Similarly, parent-led services like playcentres also encourage nature-based play and frequently use community parks and local reserves to give children the opportunity to blend with nature (MoE, 2025b). These practices reflect a shared understanding that nature is both a space for learning and a teacher, enriching children's sensory and emotional experience and strengthening their sense of belonging to the wider world.

3.6.4 Spatial Diversity: Movement, Retreat, and Creativity

Spatial diversity in ECE refers to the intentional design of physical environments that offer a range of spaces with distinct characteristics, affordances, and purposes that cater to children's different energy states, learning styles, and emotional needs (Konda & Dong, 2023). This may include activity zones, flexible and adaptable layouts, accessibility and inclusivity, sensory and material variety, and indoor-outdoor connections. Recent studies in early childhood highlight the importance of how children create their own places and spaces within ECE settings, as spatial diversity encourages environments to be layered, interconnected, and responsive (Bollig & Millei, 2018). These spatial arrangements allow children to experience their own learning, moving between spaces for gross motor activity, quiet reflection, and imaginative play as needed.

Spatial thinking is central to this diversity; environments must be organised in ways that children can interpret the purpose of spaces and feel confident navigating them. As Bollig and Millei (2018) explain, spatial literacy is cultivated when children can anticipate what to expect in different zones, thus feeling empowered and secure. Slunjski (2021) further argues that spatial diversity arises when the architectural design is closely aligned with pedagogical intentions, enabling a "dialogue" between the physical space and the child. Slunjski (2021) highlights the importance of multipurpose, transformable spaces that evolve with children's developmental needs and inquiries, an idea that reinforces the dynamic and responsive nature of ECE environments.

Furthermore, purpose-built environments allocate designated zones for varied learning and developmental stages. For instance, large outdoor areas with climbing frames, sandpits, and bike paths encourage young children's gross motor development and coordination (Konda & Dong, 2023). To support children's emotional regulation and privacy, retreat spaces are designed using soft furnishing, canopies, and reading corners with cushions and books. To encourage creativity among children, centres, particularly those inspired by the pedagogical ideas of Reggio Emilia, may include art and drama zones, allowing children to communicate their ideas in diverse ways (Slunjski, 2014b). The layout of these changes regularly based on the interests of children and the input from families, allowing for spatial arrangements that reflect the evolving needs and rhythms of each group.

3.6.5 Cultural Responsiveness

As a design principle in ECE physical environments, cultural responsiveness involves creating spaces that reflect, respect, and actively support diverse cultural identities, languages, and values of children, their families, and communities (Subasinghe, 2018). Culturally responsive environments ensure that children can see themselves, their families, and their cultural heritage displayed in the layout, materials, and atmosphere of their learning spaces. According to *Te Whāriki* (MoE, 2017), these types of environments hold a strong sense of belonging and identity in children, which are foundational for children's emotional wellbeing and holistic development.

Culturally responsive environments in ECE integrate bilingual signage, traditional artefacts, and images that represent the backgrounds of all children. For instance, walls with family photos, cultural symbols, traditional artworks, and bookshelves with stories in multiple languages reflect interconnectedness and collective care. These visuals and materials send a powerful message that every child and family is valued and respected. Further, culturally responsive environments are dynamic and evolving. Teachers regularly check on the needs and interests of the community and adapt the spaces to ensure ongoing relevance and inclusion. For example, teachers actively seek input from families, inviting them to contribute resources, share traditions, and participate in classroom life.

In practice, Te Kōhanga Reo services often arrange their spatial layouts by incorporating communal gathering areas where families can gather, and the learning of young children happens through collective storytelling, singing, and sharing of food. Similarly, Pacific Language Nests include design elements such as low seating, open spaces for group songs and dances, and symbolic decorations that support shared cultural experiences. Parent-led centres, guided by the families, often adapt the environment to reflect the cultural backgrounds of attending children, reinforcing inclusivity and representation. These culturally connected spaces reflect the interconnectedness and collective care of communities and learning environments. A culturally responsive environment is a living, inclusive space where every child and family feel, seen, valued, and empowered to learn and develop holistically.

3.6.6 Critical Issues

Designing ECE environments that reflect the design principles of flow and visibility, access to nature, aesthetic coherence, and cultural responsiveness, is not always easy. One common challenge is finding the right balance between aesthetics and functionality. As Konda and Dong (2023) assert, making a space look beautiful and making it work well for children and teachers can be difficult when there is a limited budget or when buildings are not made for modern teaching approaches. Further, they note that trying to promote flexible spaces can be tricky because health and safety rules often require certain structures or fixed furniture, which limits children's freedom to move and explore. Additionally, inclusivity presents further

challenges. Bollig and Millei (2018) affirms that “universal design” (that are accessible, usable, and inclusive for all children) may not always meet the needs of children with specific physical, sensory, or learning differences. It can also impact the cultural values and practices of diverse groups. These challenges demonstrate the need for thoughtful, reflective, and evolving design that truly supports the diverse developmental, cultural, and learning needs of all children.

3.7 Synthesis and Critical Reflection

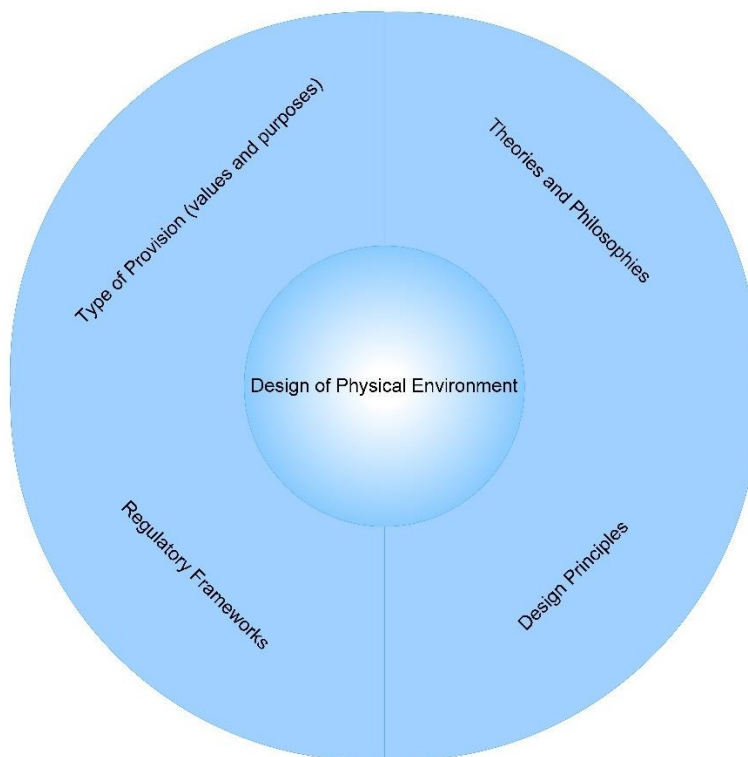


Figure 5: Conceptual model for Design of Physical Environment

How physical environments in ECE in Aotearoa New Zealand are designed is outcome of a dynamic interplay between regulatory frameworks, educational philosophies, each provision’s values, and design elements. The conceptual model developed above (Figure 4), demonstrates how these elements act together to shape the design of physical environments in ECE impacting children’s holistic development, wellbeing, and belonging. Regulatory documents like Education (ECE) Regulations 2008 and Licensing Criteria provide minimum requirements for safety, space, visibility and access to indoor-outdoor, providing foundational structure for licensed services. However, these foundational structures gain pedagogical value and cultural relevance through theoretical and philosophical approaches such as Vygotsky’s sociocultural theory, Bronfenbrenner’s bioecological theory, the Reggio Emilia approach, and the value-based ideas of Te Whāriki (MoE, 2017). All these regulations and values are interpreted differently by each type of

provision, whether it be teacher-led, parent-led or home-based. Additionally, design principles such as flow, spatial diversity and aesthetic coherence act are tools which can help realise both values and regulations within environments.

To move towards more equitable and empowering design approach within ECE, systemic support is needed. This includes funding models that recognise the cost of culturally and pedagogically rich design; professional development that bridges architectural and educational thinking; and stronger policy alignment between ECE curricula and spatial guidelines. As the OECD (2018) recommends, policies should actively promote design standards that not only meet safety criteria but also foster creativity, connection to nature, and support cultural affirmation. Ultimately, these efforts must be reflected in the physical environment itself, through thoughtfully designed spaces that support diverse learning experiences, provide access to natural elements, and authentically reflect the identities and values of children and their communities. Such environments become not only safe and compliant, but also inspiring and inclusive places where every child can thrive.

3.8 Conclusion

The design of physical environments in ECE is far more than a matter of arranging furniture or allocating space. Instead, it is a powerful and intentional act that can influence children's development, wellbeing, and sense of belonging (Alcock & Ritchie, 2018). As shown in Figure 4, the physical environment is shaped by multiple interconnected factors that work together to support children's learning and wellbeing. . Although together, these elements aim to support the design of equitable and empowering environments for children, tensions arise when those charged with design face inconsistent funding, regulatory limitations, and the impact of commercialised practices. Whether be a purpose built or repurposed spaces, to achieve the vision of *Te Whāriki* (MoE, 2017) and global equity benchmarks, ECE settings need to be supported by adequate funding models, relevant professional development, and stronger policy alignment between curriculum and spatial guidelines (Pairman, 2012). This next chapter examines how these intersecting factors can impact on children's holistic development, wellbeing and belonging.

CHAPTER 4

UNDERSTANDING THE IMPACT OF THE PHYSICAL ENVIRONMENT ON CHILDREN'S EXPERIENCES OF EARLY CHILDHOOD EDUCATION

4.1 Introduction

Children's holistic development lies at the heart of ECE in Aotearoa New Zealand, encompassing the interconnected growth of cognitive, social, emotional, physical, spiritual, and cultural dimensions. This whole-child approach recognises that young learners thrive when all aspects of their being are nurtured in responsive, empowering environments (MoE, 2017). The previous chapter explored the key factors that influence the design of early childhood education (ECE) settings, including provision types, curriculum values, educational philosophies, and spatial principles. This chapter builds on that foundation to examine how these factors influence the design of the environment and in turn, how the environment, in turn, impacts children's experiences. In doing so, it responds to the first and second sub-questions of this research examine how elements of the physical environment influence children's holistic development, wellbeing, and sense of belonging.

To explore these impacts, this chapter again draws on a wide range of sources, including empirical studies, policy documents, and *Te Whāriki* (MoE, 2017) synthesised through an integrative literature review approach suited to the complexity of ECE environments in Aotearoa.

The chapter begins by defining holistic development, and then explores how intentionally designed environments support cognitive and language growth through inquiry-rich and communicative play areas. It also examines how spatial organisation promotes social interaction, emotional regulation, and empathy. Further, the chapter discusses how access to movement and outdoor spaces fosters children's physical competence. Finally, it considers how aesthetics, predictability, and cultural representation influence children's wellbeing and sense of belonging.

Drawing on both theory and current research, this chapter argues that physical environments are not passive structures, but active, relational elements that significantly impact children's learning and development. It reinforces the view that effective ECE design must go beyond spatial or aesthetic considerations, but instead requires deep engagement with children's rights, identities, and diverse ways of being in the world.

4.2 Holistic Development in Children

Holistic development is centred around the notion that each child is unique and develops in their own way. This view moves beyond a focus on academic learning to argue that meaningful development occurs across cognitive, physical, emotional, social and spiritual domains (Gibbs, 2023). As Husni et al. (2022) explain,

the goal of this approach is to nurture all aspects of a child's potential through fostering meaningful connections with society, nature, and spiritual values.

In early childhood education, understanding the impact of holistic development is crucial. Neuroscientific research notes that 90% of a child's brain development occurs before the age of five (Erwin et al., 2022), highlighting the need of ECE to provide optimum learning environments for children to develop holistically. *Te Whāriki* (MoE, 2017) includes kohtahitanga (holistic development) as one its four principles, arguing that children's cognitive, physical, emotional, spiritual, and cultural dimensions are interconnected. According to Gibbs (2023) the curriculum aims for a broad and rich learning experiences that supports growth across all these areas, stressing that a child's learning is shaped not only by content but also by the context including the physical environment.

The next section explores how intentionally designed physical environments impact children's holistic development including their cognitive and language development, social and emotional wellbeing, physical growth, and spiritual connection.

4.2.1 Cognitive and Language Development

There are many definitions related to cognitive development in young children. According to Kumari et al. (2025) cognitive development refers to the expansion of a child's thinking and reasoning abilities. It affects various processes, including language development, memory, attention, and perception. The first six years of life is marked by rapid neural growth and high sensitivity to environmental influences (Erwin et al., 2022). A well-designed physical environment in ECE offers various stimuli and opportunities for exploration and meaningful interactions to promote children's cognitive and language development.

Drawing on Vygotsky's sociocultural theory, learning is recognised as a socially mediated process occurring through meaningful interactions with the environment and people within cultural context (McLeod, 2025). Alcock and Ritchie (2018), in their New Zealand-based study on the pedagogical use of space in early education and care centres, found that areas such as art zones, block play spaces, and dramatic play corners promoted guided participation, role-play, and peer interaction. These activities supported not only cognitive development within Vygotsky's Zone of Proximal Development (ZPD) but also enhanced children's language development. Hunter's (2019) practitioner-based empirical study found that children engage in place-making, an active, interpretive process through which they construct meaningful relationships with their surroundings, shaping their identity and belonging within learning environments. Matthews and Lippman (2019) further explain that distinct zones invite open-ended inquiry, experimentation, and collaborative problem-solving, which are aspects of higher order thinking in cognitive development. When viewed through a sociocultural lens, spatial diversity in ECE settings is more than the inclusion of different

play areas; it is a pedagogical tool that fosters social interaction, guided learning, and the co-construction of knowledge.

Similarly, the Reggio Emilia approach highlights how aesthetic coherence in ECE environments can facilitate children's cognitive and language development. For instance, Reggio-inspired ECE settings consider the environment as the "third teacher", creating visually engaging and symbolically rich spaces, encouraging children to express their thinking through multiple languages like drawing, play, talk, and construction. The idea is supported by Bollig and Millei's (2018) study across European ECE settings, which found that relational spaces, those shaped and redefined through children's social interactions and relationships, serve as a vital setting for socially mediated learning and development. According to Matthews and Lippman (2019) these spaces support spatial agency, autonomy, and negotiated social routines, facilitating the integrated development of cognitive and language skills.

Further, the environments that are rich in open-ended materials and resources have been found to encourage children to use their imagination to transform objects and spaces into inventive play, allowing them to explore, experiment, and express themselves imaginatively (Bollig & Millei, 2018). Similarly, in the New Zealand context, *Te Whāriki* (MoE, 2017), views cognitive and language development as interconnected, holistic processes that are best supported by play-based, culturally responsive, and relationship-rich environments. The curriculum places cognitive and language development predominantly in the mana reo (communication strand), and argues that children are capable, creative, and communicative learners whose development is nurtured through exploration, meaningful interactions, and respect for their cultural and linguistic backgrounds (Lee, 2013). Additionally, *Te Whāriki* (MoE, 2017) supports children's imaginative thinking skills, which are essential components of cognitive development.

Shifting the focus to design principles, Konda and Dong (2023), in their qualitative study conducted in Toronto, Canada, found that inclusive features such as flow, visibility, access to nature, aesthetic coherence, and spatial diversity support various dimensions of holistic development. For instance, Gregg (2021) noted in their conceptual analysis of visibility, that visibility helps children to self-regulate whilst maintaining a sense of safety and autonomy which are key to promoting cognitive development. Similarly, Terreni (2019) found in her comparative study of ECE environments across New Zealand, Australia, Vietnam, and China, that aesthetically pleasing, well-spaced, and balanced environments support interactions and offer space for agency and creativity in children, emphasising cognitive and language development.

Similarly, different provisions approach cognitive and language development in varied ways, often shaped by their philosophies, resources, and curriculum implementation. For example, Matthews and Lippman (2019), in their literature review of ECE environments across OECD countries including New Zealand,

highlight that purpose-built centres commonly feature clearly defined learning zones to support children's cognitive growth. Similarly, Alcock and Ritchie (2018), further found in their study, that purpose-built ECE centres are more likely to include specific zones to promote children's cognitive and language development. However, Playcentres and home-based ECE services stand out for their flexibility, personalised approach, and family-like atmosphere. These settings provide young children with more relational and conversational spaces, where language is acquired in context through shared activities and meaningful dialogue (Hunter, 2019). Whilst well-designed environments can enhance learning, poorly designed spaces may hinder it. For example, Konda and Dong (2023) in their qualitative study which sought the perspectives of both ECE educators and therapists, found how inadequate space and poorly defined areas can impact children's focus and limit sustained engagement with people and environment. These authors argue that environments that foster cognitive and language development should be materially rich, flexible, culturally inclusive, and pedagogically intentional. In order to support children as competent and confident thinkers and communicators, spaces need to be stimulating, meaningful, and encouraging by providing experiences and materials that relate to children's lives and interests, inviting exploration, and affirming each child's unique ways of knowing and expressing themselves (Konda & Dong, 2023).

4.2.2 Social and Emotional Development

A well-designed physical environment can also provide opportunities for relationship-building, emotional expression, and self-regulation in young children. In ECE settings, teachers, peers and the immediate environment play the role of co-constructors of knowledge (Hunter, 2019), emphasising that socially rich spaces support social and emotional skills.

Recent studies in New Zealand and international ECE contexts such as those by Matthews and Lippman (2019), Terreni (2019), and Konda and Dong (2023) provide clear evidence of the positive impact of well-designed physical environments on children's social and emotional learning. Matthews and Lippman (2019) found that collaborative zones such as dramatic play areas, group tables, and shared construction spaces enable children to engage in emotionally rich peer interactions. Further, they point out that these spaces help children to navigate complex social dynamics like turn-taking, conflict resolution, and cooperation, which are essential components in social and emotional development. Further, research and practice in ECE indicates that certain physical design principles impact children's social behaviour and emotional development. According to Konda and Dong (2023), design principles such as flow, visibility, access to nature, aesthetic coherence, and spatial diversity, support children's social development and emotional security. Similarly, Matthews and Lippman (2019) found that visibility of clear sightlines within the ECE environment, helps children to self-regulate whilst maintaining a sense of safety and autonomy which are key to emotional development. Likewise, Terreni (2019), found in her comparative study that sensory

features like colour, texture, light, and acoustics can foster calmness, exploration, and belonging in children. Additionally, colours and lighting (natural or diffused) can create a sense of warmth and familiarity which encourages children's social engagement and emotional wellbeing (Terreni, 2019).

Moreover, in *Te Whāriki* (MoE, 2017), the strands of mana tangata (contribution) and mana whenua (belonging) strengthen the idea that when the environment provides "equitable opportunities" (p. 24) for children not only to learn but also feel valued and connected with their learning communities. For instance, environments that rich with children's work and creations send an idea that these children are accepted and valued by the environment. Such feelings are foundational to social and emotional development (Subasinghe, 2018). Further, as a bicultural curriculum, *Te Whāriki* (MoE, 2017) stresses that environments need to strongly reflect children's identity, language, and culture (MoE, 2017). This idea can be incorporated through the display of family photos, bilingual labels, culturally relevant artefacts, and design elements that connect to children's local communities. Such culturally responsive design promotes positive social interactions and empathy towards others (Subasinghe, 2018). Further, Knauf (2019) and Hunter (2019) found in their studies that high-quality physical environments which they define as safe, spacious, well-organised, and rich in developmentally appropriate materials, facilitate children's social competence and minimise behaviour problems.

Conversely, poorly designed spaces such as overcrowded or noisy spaces have been found to have negative effects, for example they can increase children's stress and aggression, and may impact their sense of emotional security (Matthews & Lippman, 2019). Additionally, over-regulated environments, where movement and interaction are tightly controlled for efficiency rather than emotional wellbeing, may undermine freedom and relational warmth (Knauf, 2019). Bollig and Millei (2018), in their exploration of spatial arrangements in ECE settings in Europe, found that such environments can lead to over-surveillance and behavioural conformity, which restrict children's emotional expressiveness and limit opportunities for authentic social interaction.

Environments that are culturally passive (an absence of children's cultural identities) can also negatively impact emotional wellbeing, especially for children from Māori, Pasifika, or other non-dominant backgrounds whose cultural ways of being may not be reflected in the space (Subasinghe, 2018). Jenkin's (2017) qualitative study on biculturalism within the context of New Zealand ECE, revealed that ECE educators held limited or ambiguous understandings of biculturalism, which often resulted in superficial or tokenistic expressions of cultural identity in the learning environment. Such approaches risk undermining a genuine sense of emotional security and belonging for Indigenous and minority children. . These challenges highlight the importance of designing environments that are not only functional but emotionally

nurturing and culturally inclusive, ensuring that all children feel safe, valued, and free to express themselves.

Overall, physical environments that promote visibility, cultural inclusion, collaborative engagement, and emotional safety in ECE settings, promote children's social and emotional competence. Considering all of these factors in environment design can foster relationships, self-regulation and empathy in children. On the other hand, environments that are over-regulated, overstimulating, or culturally disconnected can hinder these vital areas of development.

4.2.3 Physical Development

Physical development, as a key domain of holistic growth, is closely shaped by the design and structure of ECE environments. Research shows that well-designed physical spaces, particularly those that allow for movement, exploration, and sensory interaction, are essential for developing children's gross and fine motor skills, balance, coordination, and spatial awareness (Matthews, 2020). Design elements such as outdoor access, diverse terrain, and spaces for active and quiet play serve as key enablers of physical development (Sandseter et al., 2022b).

In Aotearoa New Zealand, *Te Whāriki* (MoE, 2017) promotes physical wellbeing under the strand of mana atua (wellbeing), which encourages environments that support movement, activity, and bodily autonomy, enabling children to move confidently and challenge themselves physically. These ideas align with the principles of whakamana (empowerment) and kotahitanga (holistic development), which consider physical activity not as separate from learning but as interconnected with cognitive, emotional, and social growth (Lee, 2013). Physical play also provides rich opportunities for integrating communication and cooperation, as children negotiate space, equipment, and group dynamics.

Although, indoor environments in ECE contribute significantly to physical development by enabling functional play through intentionally designed spaces, Sandseter et al. (2022b), in their empirical study which was focused on the relationship between physical environment design and children's engagement in gross motor activities in Norwegian ECE settings, found that children increased their physical activities such as running and jumping when provided with dedicated areas like tumbling rooms or physical activity zones. Such environments support gross motor development by offering affordances that invite movement. However, the study also found that such opportunities are often limited to specific spaces, suggesting the need for more flexible environments that integrate movement possibilities throughout the setting to better support children's holistic physical growth.

4.2.3.1 Outdoor Spaces

Matthews and Lippman (2019) emphasise that outdoor spaces are essential for supporting the physical development of young children, offering opportunities that are not easily replicated indoors. Unlike indoor environments, which often limit space and movement, outdoor spaces allow children to engage in more frequent and sustained physical activity. According to Sandseter et al. (2022a), natural outdoor environments promote moderate to vigorous physical engagement, enabling children to develop both gross and fine motor skills through active exploration. Physical features such as rocks, trees, and varied terrain encourage climbing, balancing, and other movements that enhance coordination and physical competence. Sandseter et al. (2022a) also assert the importance of moveable equipment and natural loose parts, which provide adaptable and flexible resources that evolve with children's growing capabilities and interests. Furthermore, open spaces support a variety of large-movement activities such as running, rough-and-tumble play, and group games, contributing to children's physical confidence and mastery. Together, these features highlight the vital contribution of outdoor environments to children's overall physical development.

4.2.3.2 Equipment and Resources

Furthermore, access to varied gross motor zones such as climbing frames, ramps, sandpits, tunnels, and balance beams, supports children's development of movement competence, enabling them to explore their physical limits and capabilities in safe yet stimulating environments. Matthews and Lippman (2019) observed that well-designed climbing equipment and loose parts (characterised by age-appropriate, stable, varied levels of challenge, and flexibility), allow children to take physical risks in developmentally appropriate ways, supporting muscular strength and coordination. These spaces also foster autonomy, resilience, and persistence in young children. However, as discussed in chapter three, regulatory safety requirements may limit the availability or complexity of such equipment and resources, reducing opportunities for positive risk taking.

Whilst regulatory frameworks in Aotearoa New Zealand play an essential role in ensuring baseline safety and quality in ECE settings, their impact on children's physical development depends on how they are interpreted and enacted. The Education (Early Childhood Services) Regulations 2008 in New Zealand mandate minimum indoor and outdoor space per child, maintaining the safety and quality of the environment. However, Pairman's (2012) study on the role of physical environments in New Zealand's ECE sector found that regulations are often met at a minimal standard level, leading to overcrowded or under-stimulating environments that restrict movement and limit the diversity of physical activity. In such cases, design becomes an exercise in meeting spatial allocations rather than fostering children's agency and physical learning. This reflects a tension between meeting regulatory standards and supporting rich, meaningful developmental experiences. Further, Smith et al. (2014) argue that whilst some materials

encourage movement, others may restrict it, highlighting the importance of thoughtful material placement. Natural spaces provide unique affordances for climbing and exploration, yet many ECE settings lack these features (Zamani, 2016). This suggests a need for more inclusive playground design that goes beyond static structures to support dynamic, child-led physical engagement (Zamani, 2016). Ultimately, outdoor environment design that provides both enough space and rich, open-ended materials are crucial for fostering physical competence and confidence in early learners.

To support optimal physical development, ECE environments must balance safety with freedom, predictability with flexibility, and structure with open-endedness (Smith et al., 2014). Matthews (2020) argues that physical development is not only supported by large motor spaces but also by indoor areas designed for fine motor activities such as puzzles, threading materials, and creative arts. These must be physically appropriate and arranged in spaces to encourage independent use and repetition, a key aspect of skill mastery. Regulatory frameworks and thoughtful design principles must work together to create inclusive, flexible, and responsive spaces that promote not just movement, but autonomy, and flexibility in physical activities

4.2.4 Spiritual Development

Spiritual development is an integral aspect of holistic development in ECE. As described in *Te Whāriki* (MoE, 2017) spirituality means the connections children form with people, places, and things. According to Greenfield (2018), this can be closely tied to the physical environment in ECE settings. Greenfield's (2018) qualitative study seeking New Zealand ECE teachers perspectives of spirituality found that children may experience spirituality through calm, aesthetically harmonious, and nature rich spaces that nurture inner peace, curiosity, and emotional connection. Further, the study discovered how natural elements such as light, plants, and quiet corners create opportunities for reflection and connection with the centre's environment. Everyday routines like gardening, unhurried play, art and music offer further opportunities for children to explore and express their spirituality.

Spiritual development in ECE is closely connected to the physical environment, as intentionally designed spaces can foster a sense of peace, wonder, and connection. Including natural elements and activities like gardening into physical spaces, children can develop care, empathy, and sense of responsibility for the environment (Smith et al., 2014). Tulloch et al. (2023) argue that such experiences are intrinsically spiritual, as they connect children to nature and encourage them to care for the world around them. It is therefore essential that teachers intentionally shape and use environments to support these experiences.

However, this dimension is often overlooked in practice, highlighting the need for more targeted professional development and reflective engagement (Greenfield, 2018). Nurturing children's spiritual

development through the physical environment is not only a pedagogical intention but also a cultural responsibility, requiring thoughtful spatial design that honours spiritual development as part of everyday experiences. Closely interconnected with this is how children experience a sense of belonging and wellbeing at their ECE centre.

This next section turns to explore how such physical environments in ECE impact children's sense of belonging and wellbeing, two closely linked concepts that often discussed separately, in shaping children's emotional security, identity formation.

4.3 Sense of Belonging and Wellbeing

4.3.1 Wellbeing

Wellbeing in ECE refers to a child's overall sense of safety, health, happiness, and emotional security within the early learning environment (Stewart et al., 2024). It is multidimensional concept that covers physical comfort, emotional stability, social connectedness, and psychological safety. In ECE, wellbeing is seen as one of the outcomes of quality education. In Aotearoa New Zealand, *Te Whāriki* (MoE,2017) identifies mana atua (wellbeing) as one of its strands, emphasising that children must experience an environment where their health is promoted, emotional needs are identified and answered. Additionally, Terreni (2019) affirms that children must feel protected and must be able to experience flexibility and independence in these environments. As Afrin and Bishop (2023) argue, well-designed environments with elements such as aesthetics and cultural symbols, promote identity, emotional security, and reduces anxiety in children. It is therefore, important to understand how environments impact on children's wellbeing and sense of belonging and cultural identity.

Wellbeing in ECE involves more than emotional comfort. It encompasses children experiencing sensory satisfaction, spatial predictability, and aesthetic pleasure (Afrin & Bishop, 2023). Terreni (2019) draws ideas from Reggio Emilia principles, describing how environments communicating with children through light, texture, organisation, and cultural symbolism. Further, Terreni (2019) claims that aesthetically considered environments, rich in natural light, calming tones, contribute to children's psychological wellbeing. These features offer cues that orient children within the space and reduce cognitive overload, fostering a sense of control and predictability. In alignment with these ideas, Afrin and Bishop (2023) argue that sensory features such as soft lighting, warm colour palettes, and acoustic buffering mitigate overstimulation and promote calm states that are foundational to learning and emotional regulation. Similarly, Alcock and Ritchie (2018) note in their study that there is a link between aesthetics and wellbeing. They argue this is a fundamental right of children. Environments that arouse curiosity, offer sensory harmony, and reflect beauty encourage emotional engagement and motivation. For instance, displays of children's work, natural materials, and open-ended resources may contribute to a sense of accomplishment

and validation (Alcock & Ritchie, 2018). As children interact with intentionally curated spaces, their wellbeing is supported by feelings of competence and respect (Terreni, 2019).

When cultural representation is absent in ECE environments, children's sense of wellbeing and inclusion can be negatively affected. Environments that are culturally passive or neutral often fail to affirm non-dominant cultural identities, potentially causing children to feel invisible or alienated (Jenkin, 2017). Subasinghe (2018), in their research exploring multicultural practices in New Zealand ECE centres, found that embracing children's cultural capital through family involvement and including diverse resources enhances equity and deepens belonging. Creating culturally rich environments is not about symbolic decorations but about authentically embedding the lived experiences of children and whānau into the physical spaces they spend time in. This practice is vital for the emotional safety of all children, as it nurtures empathy, mutual respect, and intercultural understanding from an early age.

Moreover, the predictability and clarity of spatial organisation help reduce anxiety and enhance security. According to Terreni (2019), clearly defined spaces such as reading nooks, art corners, or family photo displays, help children anticipate routines and transitions, lowering stress. Predictable routines within such environments help to build trust and confidence in young children (MoE, 2017). However, overly structured and aesthetically curated environments can sometimes suppress spontaneous exploration and creativity, especially if adult control over space becomes too rigid (Subasinghe, 2018). In such cases, the environment may reflect adult expectations more than children's lived experiences, leading to a sense of disconnection where children may feel controlled, particularly those who thrive in more open-ended or sensory-stimulating contexts. Thus, even well-designed spaces must remain responsive to children's dynamic needs to avoid undermining their emotional freedom and authentic self-expression.

4.3.2 Sense of Belonging and Cultural Identity

According to *Te Whāriki* (MoE, 2017), belonging refers to a child's feeling of being accepted, valued, and connected within their learning environment. In other words, physical environment should understand children's feelings of inclusion, cultural affirmation, and social integration (Lee, 2013). For instance, environments that are rich in architecture, artefacts, displays, and spatial organisation can convey powerful messages about whose identities are valued and whose ways of being are welcomed (Tualaulelei & Taylor-Leech, 2020). However, when poorly considered or overly standardised, these spaces may unintentionally marginalise, exclude, or silence children from diverse backgrounds.

In Aotearoa New Zealand, early childhood environments are increasingly understood through indigenous lenses that emphasise relational space and belonging. According to Lee (2013), *Te Whāriki* (MoE, 2017) places a strong emphasis on belonging and identity, recognising that children come into ECE settings with

diverse cultural narratives that should be respected and built upon. From a Māori perspective, children's sense of mana whenua (belonging) and mana tangata (contribution) are grounded in relationships with people, place, and the wider environment, highlighting that a child's identity and belonging are sustained by connections to family, ancestors, land, and community. This suggests that an ECE environment should reflect and reinforce those connections.

A culturally affirming environment enables children to feel seen, heard, and valued (Bernard, 2024). Subasinghe's (2018) qualitative study of three ECE centres in Auckland, illustrates how environments incorporate bilingual signage, culturally relevant music, family photographs, and artefacts to create culturally safe spaces. These elements affirm children's home values and worldviews are supported within the learning environment. This representation fosters pride and emotional security, especially for Māori, Pasifika, and migrant children who may otherwise feel marginalised in mainly Eurocentric spaces. For example, Tualalelei and Taylor-Leech (2020) found that a Samoan bilingual kindergarten room embedded within a mainstream setting promoted children's positive cultural identities by surrounding them with language, materials, and artefacts familiar from home. These spaces, referred to as "culturally safe," not only supported the children's learning but also nurtured their emotional and spiritual wellbeing. Such design practices not only acknowledge cultural diversity but validate the child's full self, supporting the development of secure attachments and confident learner identities.

However, the absence of such features can have detrimental effects. Shuker and Cherrington (2016), in their national survey of 335 New Zealand ECE services, discovered that in many ECE settings, educators gather only basic cultural and language information about children, mainly what is required for official paperwork. Furthermore, they do not always use this information to design learning spaces or activities that truly reflect the children's cultural backgrounds. As a result, there is a risk that children may encounter spaces that are culturally passive and encourages children to fit into dominant culture, rather than allowing them to express their own. This can unintentionally suppress or ignore the cultural identities of children from groups like Māori and Pasifika, whose values, traditions, and ways of learning may be left out of mainstream ECE spaces. When this happens, children might feel like their backgrounds do not belong or are not important in the learning environment (Subasinghe, 2018).

Whilst intentionally designed culturally inclusive environments can offer deep benefits to children's sense of belonging and cultural identity, they must also be flexible and constructed with children's families and communities. Bernard's (2024) scoping review of sociocultural perspectives in ECE affirms that creating an inclusive environment not only includes the physical display of cultural items, but also involves ongoing discussions and shared decision-making with families and communities. This ensures that environmental

design is not tokenistic but grounded in the lived realities and values of the children it serves (Bernard, 2024).

Overall, children's sense of belonging and cultural identity can improve through the physical and symbolic messages embedded in ECE environments. Intentionally designed spaces affirm that cultures and identities can nurture children's confidence, emotional security and sense of belonging. However, when ECE spaces lack children's cultural identities, those from non-dominant backgrounds may be marginalised and experience less of a sense of place. Embedding cultural identity into the physical environment must go beyond the representation of visual symbols. It needs to be built on deep engagement with families, communities, and the cultural backgrounds that children bring with them. As ECE centres in Aotearoa New Zealand continue to embrace biculturalism, promoting culturally affirming environments should become not only a design choice but an ethical responsibility that support children's right to belong and cultural recognition.

4.4 Synthesis and Critical Reflection

This chapter has explored how physical environments in ECE impact children's holistic development along with wellbeing and sense of belonging. Throughout the chapter, it is clearly shown how spatial design impacts each domain of development. For instance, cognitive development is supported by environments that promote agency, exploration, and problem solving, using flexible zones, visibility, and flow (Konda & Dong, 2023). Social and emotional development is fostered in relationally rich environments where design encourages interaction, emotional regulation, and trust. Similarly, physical development is fostered in environments that allow access to both indoor and outdoor environments with varied affordances, such as climbing structures, loose parts, and open movement spaces ((Little, 2020; Matthews & Lippman, 2019). Children's wellbeing is enhanced by environments that are calm, predictable, and aesthetically responsive (Afrin & Bishop, 2023; Terreni, 2019)), while their sense of belonging and cultural identity flourishes when environments reflect children's languages, traditions, and values in authentic, participatory ways (Bernard, 2024; Subasinghe, 2018).

However, these positive effects are not always without tensions. As the literature has highlighted throughout this chapter, the physical environment can also impact children negatively when spaces are overcrowded, overly standardised, or culturally passive. Regulatory frameworks, whilst necessary for ensuring baseline safety and quality, can become limiting when interpreted narrowly, reducing space to minimum measurements rather than enabling exploration, autonomy, and risk-taking (Pairman, 2012; Robson, 2017). Overly observed layouts may suppress children's emotional expression or promote negative behaviour at the expense of creativity and self-awareness (Bollig & Millei, 2018). Furthermore, design practices grounded in Eurocentric aesthetics or pedagogies may marginalise the lived realities and cultural values of

Māori, Pasifika, and migrant children, impacting their sense of belonging and spiritual connection to space (Jenkin, 2017; Tualaulelei & Taylor-Leech, 2020).

Additionally, the physical environment alone does not guarantee positive developmental outcomes, it is the combination of relational and pedagogical use of that space. As Chaparro et al. (2020) and Hunter (2019) argue, environments become meaningful when they are co-constructed and responsive, rather than simply structured or decorated. In summary, spatial design must incorporate social practices, cultural responsiveness, and curriculum representation that align well with the holistic values of Te Whāriki (MoE, 2017).

Table 1 below provides not only a synthesis of findings, but also a critical framework for recognising the complex, sometimes contradictory nature of physical design in ECE. It highlights both the positive impacts and potential challenges associated with each factor, offering a comprehensive view of how physical environments shape children’s development and learning.

| Design Feature/Environmental Factor | Developmental Impact | Challenge/ Limitations |
|-------------------------------------|--|---|
| Visibility and flow | Supports autonomy, safety, self-regulations, cognitive focus, social connection | Can lead to over-surveillance and loss of privacy |
| Spatial diversity | Flexible learning, problem-solving, gross and fine motor development, social interaction | Fixed layouts and regulations may limit flexibility |
| Aesthetic coherence | Enhance emotional wellbeing, sensory regulation, concentration, creativity | May reflect adult tastes more than children’s needs |
| Cultural responsiveness | Supports belonging, identity formation, empathy, equity in learning opportunities | Often overlooked or done in a surface level |
| Access to nature | promotes physical health, sensory regulations, environmental identity, exploration, resilience | Not all centres have enough outdoor spaces |
| Collaborative zones | Facilitate social skills, emotional regulations, and peer cooperations | Can cause overstimulation |
| Safety and regulations | Ensures physical wellbeing whilst balancing risk and exploration | Can lead to minimum standard mindset |

Table 1: Synthesis of the Findings

As this chapter has illustrated, when thoughtfully designed and meaningfully used, physical environments in ECE can become interconnected, dynamic contributors to young children’s holistic development. To design such environments, a shift in mindset from environments as passive, to environments as ethical, cultural, and pedagogical participants in learning is needed. The true success of a well-designed ECE environment lies in its ability to respond to children’s diverse needs and ways of being, promoting their holistic development in authentic, empowering ways. As ECE settings in Aotearoa continue to evolve, it

becomes essential to consider not only what the environment looks like, but how it feels, functions, and speaks to the children who live it, ensuring that every space nurtures their potential, wellbeing, and identity as unique individuals.

4.5 Conclusion

This chapter has found that physical environments are not neutral settings but active contributors to children's development, wellbeing, and identity formation. The analysis in this chapter confirms that spatial design elements play a central role in shaping children's learning and development across cognitive, social-emotional, physical, and cultural domains. It is important to understand that such environments are designed to promote agency, emotional security, cultural affirmation, and development. However, this chapter also reveals specific limitations such as regulatory frameworks, which may inadvertently prioritise conformity over quality, leading to overcrowded, under-stimulating, or overly standardised spaces. As ECE in Aotearoa New Zealand continues to evolve within bicultural and multicultural context, the design of physical environments must also evolve accordingly. . In doing so, learning environments can become not just settings that promote development, but meaningful partners in each child's experiences.

CHAPTER 5

DISCUSSION, LIMITATION, AND CONCLUSION

5.1 Discussion

This integrative review has revealed that the physical environment in ECE settings plays a pedagogical and ethical role in shaping not only how children learn, but how they feel valued, included, and recognised in their learning spaces. In this way, environments act as dynamic agents that influence how children move, feel, think, and relate. The review affirms the widely accepted concept of the physical environment as a “third teacher” yet pushes this idea further by exploring its implications for equity, cultural identity, and ecological consciousness within the context of Aotearoa New Zealand. One of the most significant findings is the multidimensional nature of the environment’s influence in ECE. It supports cognitive development through exploration and inquiry and simultaneously encourages social interaction, wellbeing and identity formation in young children. Further, in well-designed settings, children experience sense of belonging, safety, and spirituality, whilst gaining the confidence to act autonomously and collaboratively. However, such outcomes do not occur by chance. They emerge from environments that are designed to reflect cultural values, rich with spatial and sensory elements, and provide access to nature. The evidence also reveals persistent barriers to achieving equitable, culturally responsive environments. Whilst *Te Whāriki* (MoE, 2017) promotes biculturalism and encourages environments that reflect cultural and community contexts, its vision is not uniformly enacted. Limitations in teacher training and knowledge, especially regarding Māori worldviews, can result in environments that minimally acknowledge bicultural values or omit them entirely (Subasinghe, 2018). This inconsistency raises critical questions about whose identities are centred and whose are marginalised in ECE settings. This review also brings to light the influence of systemic factors such as privatisation and regulation. Commercially driven settings may prioritise cost-efficiency over design quality, leading to standardised environments that limit children’s experiences (Pairman, 2012). Regulatory requirements, though vital for safety, can enforce fixed spatial standards that reduce adaptability of spaces to children’s evolving needs. In these cases, physical design may unintentionally reflect adult convenience or institutional norms, rather than being grounded in pedagogical cultural or local responsiveness.

Overall, this review highlights that physical environments are not just settings where learning happens. They are active contributors to children’s development, identity, and sense of belonging. The way spaces are designed can empower children or hold them back. In this context, thoughtful design is not a luxury or a privilege, it is a fundamental requirement for delivering equitable, culturally grounded, and child-centred early education. In order to reflect the aspirations of *Te Whāriki* (MoE, 2017), ECE physical environments

in Aotearoa New Zealand must be responsive to diverse needs, languages, cultures, and communities of all children (Subasinghe, 2018). To create such environments, there should be collaboration between educators, policymakers, and communities to ensure that every child sees themselves reflected in the spaces where they learn and grow.

5.2 Recommendation

Building on the insights drawn from the literature, the following section outlines specific, evidence-informed recommendations for policy makers, educators, and researchers, with the aim of bridging the gap between curriculum aspirations and the lived realities of physical environments in early childhood education.

For Policy Makers

Compared to some OECD counterparts, New Zealand has further opportunity to strengthen its recognition of the physical environment as a foundational element in ECE (Mitchell, 2019). Whilst *Te Whāriki* (MoE, 2017) offers a progressive, bicultural curriculum, there is a notable policy gap in how physical spaces are regulated, supported, and resourced. To address this problem, regulatory frameworks must evolve beyond minimum safety standards. Policy should promote environments that are flexible, culturally inclusive, and aligned with children's rights to participate, belong and thrive. Further, funding equity is also vital. Market-driven provision has led to significant variation in spatial quality across centres (Kearns & Ritchie, 2020) and it is important to target funding to upgrade under-resourced settings and reduce such inequities. Furthermore, national policies could be strengthened to support sustained professional development on how to design culturally responsive environments that reflect children's identities and values. Teachers and centre leaders may also benefit from training that integrates Māori perspectives and sustainable design principles into practice. Investment in spatial design training would help bridge the gap between policy ideals and everyday practice, enhancing learning and wellbeing outcomes for young children across the country (Subasinghe, 2018).

For Educators and Centre Leaders

For those settings where practice remains largely compliance-focused, educators and centre leaders are encouraged to move beyond simply meeting regulations and instead treat ECE environments as active teaching tools that support children's independence, connection, and wellbeing (Vecchi, 2010; Robson, 2017). Bringing the principles of *Te Whāriki* (MoE, 2017) to life requires more than theory. It requires ongoing, genuine engagement with *mānāwhenua* (land) and *whānau* (family), to co-create spaces where Māori values like *whanaungatanga* (relationships), *kaitiakitanga* (guardianship), and *manaakitanga* (care) are visible and meaningful. This could involve holding regular meetings with families, inviting community

stories into the centre, and including children in decisions about how their spaces are used. Sensory elements like light, textures, and natural materials should be thoughtfully considered. Educators could observe how children use space and make changes based on their needs and interests. Additionally, centre leaders play a vital role by providing time, funding, and professional development focused on spatial design, bicultural practice, and sustainability. Regular self-review using environmental quality tools can help track progress. Lastly, educators and leaders can contribute to broader change by sharing their insights and encouraging for stronger policy and funding support, helping to ensure all centres can create environments that truly support every child.

For Future Research

There are several areas that remain underexplored. Future research should examine how children from diverse cultural and socio-economic backgrounds experience and navigate different types of ECE environments, particularly in relation to equity, identity formation, and belonging. More studies are also needed on how Māori design principles can be meaningfully embedded into everyday spatial practice, beyond symbolic gestures. Additionally, research could also further explore the effects of privatisation and commercial constraints on spatial quality across different types of ECE services. Comparative studies between privately owned, community-based, and state-funded settings may illuminate structural disparities which would be invaluable for both policy and practice development in Aotearoa New Zealand.

5.3 Limitations

This study faces several limitations. First, since it is an integrative literature review, the findings are dependent on the scope and quality of the existing literature. There was no primary data collection in this study. It is clear that the interpretations presented in this review are shaped by available sources and may not adequately reflect the full diversity of practices in ECE settings. Second, the study focused primarily on physical environments. Although it is interconnected with relational, pedagogical, and emotional dimensions, they were not explored in equal depth. This review did not analyse interactions of spatial design upon specific population groups, such as infants, toddlers, children with additional learning needs, immigrant families, or Pasifika communities. Finally, the literature revealed a bigger issue as there is not enough research on how Māori design principles are meaningfully integrated into ECE environments. This presents a critical area for future research and practice, especially in light of Aotearoa's bicultural commitments under *Te Whāriki* (MoE, 2017) and Te Tiriti o Waitangi.

5.4 Conclusion

This dissertation aimed to bridge the gap between curriculum principles and real-world practices by conducting an integrative literature review across education, design, and policy domains. It critically

explored how the physical environment in ECE settings influences children's holistic development, wellbeing and belongingness, with a particular focus on children aged 3-5 years, attending ECE in Aotearoa New Zealand. Drawing on an integrative review of both research and policy, and design thinking, it has demonstrated that the environment as an active force that powerfully mediates children's agency, cultural identity, and holistic development.

The analysis revealed that thoughtfully designed environments that are flexible, inclusive, aesthetically engaging, and culturally grounded, support children's autonomy, creativity, social competence, and sense of belonging. Drawing on theoretical perspectives such as Vygotsky's sociocultural theory and Bronfenbrenner's bioecological systems theory, the research demonstrated how the physical environment actively mediates learning (Bollig & Millei, 2018). Through tracing the historical and policy contexts shaping ECE in Aotearoa, it has demonstrated how global philosophies such as Reggio Emilia, and theories such as those of Froebel, have intersected with Māori knowledge systems, particularly through the conceptualisation and implementation of *Te Whāriki* (MoE, 2017).

Despite a strong policy commitment to biculturalism and equity, barriers persist. These include unequal resource distribution, and limited integration of Māori perspectives in some centres, especially in some privatised contexts. These gaps raise critical questions of equity and representation. To address these, the study has presented targeted recommendations for policy makers, educators, and researchers. Future design efforts must be collaborative, inclusive, and culturally sustaining. Policy needs to be more directive and equitable, and research must continue seeking children's lived experiences of the physical environment, particularly in underrepresented communities.

Ultimately, designing responsive physical environments is both an educational and ethical imperative. It is through intentional, values-driven design that we create ECE settings where every child in Aotearoa can learn, grow, and belong.

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