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Master of Professional Practice

Developing Best Practice Guidelines in Designing Physical Learning Environments for Students with Complex Needs.

(Our Place, Our Potential: Navigating the Design Process of Learning Environments for Students with Additional Needs)

Contents Page

Attestation of authorship 2
Executive Summary 3
Chapter One: Introduction 5
Chapter Two: Literature Review 9
Chapter Three: Methodology 17
Chapter Four: Work Practice 20
Chapter Five: Findings 28
Chapter Six: Outputs and conclusion 32
Reflective Summary (Redacted) 35
References 36
Appendices 46
Attestation of authorship

I hereby declare that this submission is my own work at 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 acknowledgments), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of an institution of higher learning.
Executive Summary

This body of research explores the planning and design processes of learning areas for students with additional needs in Aotearoa New Zealand. The central case study is Blomfield Special School’s new two-classroom satellite unit at Oromahoe School in Northland. The Ministry of Education (MoE) manages a portfolio of nearly 2100 state-owned schools with an estimated 100,000 additional student places needed by 2030 (MoE, 2019). Specialist schools make up 2% of this portfolio catering for 40% of Ongoing Resourcing Scheme (ORS)-funded students in Auckland but only 20% in Northland. School property management is a semi-devolved partnership between the ministry and schools and is becoming more complex and time-consuming. Clear MoE guidelines and requirements sit alongside building codes and regulations aimed at meeting the varied needs of students (ākonga). Architects, project managers, MoE property delivery managers and schools work collaboratively to build quality learning environments.

The catalyst for undertaking this master’s degree stemmed from my involvement in creating a satellite unit for students living in the Mid-North who attend Blomfield Special School (hereinafter referred to as Blomfield). The aim of my research was to explore pedagogical practices, school property design, and how students with additional needs interact with physical learning environments so we could better support our children (tamariki) to discover and reach their potential. As an inside-researcher I took a qualitative approach focused on the subjective experiences of professionals and key stakeholders and triangulated these findings with data from researchers in related disciplines, and first-hand knowledge gained as the Blomfield Property Coordinator and member of the Oromahoe satellite unit Project Control Group (PCG).

This research project culminates in a written report outlining my motivation, purpose of the study, a situational analysis of Blomfield and its Oromahoe satellite unit (hereinafter referred to as Oromahoe), and a risk analysis of the students attending. The Literature Review explores the diverse range of learning difficulties and disabilities, how teachers (kaiako) and their pedagogical practices impact ākonga, planning and design processes, change-management, consultation, best practice models of design, and the MoE property requirements and guidelines. The Work Practice chapter describes the inception, planning and design processes for Oromahoe and other building projects at Blomfield, and summarises data from focus groups, professional discussions and school visits highlighting positive and negative aspects of physical spaces. The Findings, Outputs and Conclusion chapters pull all this information together with a Reflective Summary, Portfolio of Evidence in a series of appendices, and a simplified list of recommendations to be shared with the wider community of practice.

At the heart of this research is understanding what underpins quality learning spaces for students with additional needs. Two key elements, flexibility and safety, underpin nearly all design features. Flexibility comes from having enough space and a well-designed layout with multipurpose-zones, flow between indoors and outdoors, moveable furniture and equipment, and operable-walls or ranch sliders. Safety involves secure facilities and outdoor spaces, robust building material and furniture, careful placement of glass, line-of-sight for passive supervision, and areas for teaching and learning with low sensory and “crash and bash” zones. When ākonga feel safe they can engage in learning that is personalised, inclusive, culturally
responsive and fun. The MoE calculates specific entitlements for every new-build or renovation (MoE, 2020a), so making the most of each square metre, and consultation between schools, architects, the MoE and local communities is crucial. Good designs work well for all students, not just those with complex or additional needs so the findings of this report are applicable to all schools.
Chapter One: Introduction

This chapter outlines why I chose to undertake a master’s degree that is challenging and time-consuming but has resulted in significant personal and professional development. I look forward to sharing my analysis of how we approached the design of learning areas for students with additional needs. I set the scene by describing how Oromahoe came to be, explain a little about the students who attend this unit and give a brief overview of the planning and design stages the PCG followed to turn squares on a piece of paper into reality.

Motivation

In revisiting my original motivation for starting this research, one reason no longer exists. The appeal of working overseas has diminished, at least until the impact of COVID-19 settles. What remains is intrinsic and is related to developing my professional capacity. Sometimes in our careers and lives, we need to diversify. Expanding on my Bachelor of Social Services in Career Practice would have been interesting; however, my career options could potentially be limited. By focusing on property design my pathways are broader and include other roles yet to be discovered. It is my passion for enabling young people to discover and reach their potential that keeps me in the field of education. I see my involvement in designing and maintaining physical learning spaces as a way to support teaching and learning.

There is a sense of achievement that comes from designing purpose-built classrooms, knowing they will make a difference in the lives of our most vulnerable students, while supporting quality teaching and learning. The PCG took basic concepts and created a learning environment for ākonga to use for years to come. Expanding my skills and knowledge within the field of school design enables me to confidently support Blomfield as the government moves towards centralising management and maintenance of school property following a review of Tomorrow’s Schools. MoE (2019) states that some schools will retain responsibility based on national criteria. What that criteria will look like remains to be seen.

It is important to me when I support others, that what I say and do is founded on expertise and experience, not just mine, but that of others who have walked the same path. Professional discussions undertaken highlight the importance of talking to people who have designed and used new learning spaces, to learn from the insights and mistakes of others and not recreate the wheel with my outputs. As Sir Isaac Newton said, “If I have seen further, it is by standing on the shoulders of giants” (BBC, n.d.)

Purpose of study

In this research project I combine the disciplines of education and property design with knowledge of the range of disabilities and additional needs students bring with them to specialist schools. Added to this is cultural inclusion and environmental sustainability in Aotearoa at a time when a pandemic, global warming and economic uncertainties abound. The key purpose of education is learning for all students, not just some or most (Bishop, 2019). One of the most important elements impacting outcomes for students is the professional and adaptive expertise of teachers who understand that sustainable learning happens when there is meaningful engagement (Nel, 2017; Dumont, 2010). The process of engagement is a journey connecting children and their environment, which includes people, ideas, materials and concepts (Carpenter et al., 2015). My research examines this intersection of students, the environment and the pedagogical approach Bishop (2019) refers to as relationship based
learning. He believes there needs to be extended family-like relationships where power is shared and the young person’s culturally located sense-making processes and knowledge are validated. Blomfield’s curriculum centres around co-creating personalised learning plans with whānau (families) spring boarding off the child’s perspective of what they enjoy doing and their personal strengths.

Designing learning environments that are fit for purpose requires a collaborative approach with a communal understanding of what is required. It is difficult and expensive to modify schools once plans are in place and construction is underway. Obvious design aspects professionals are aware of include the need for additional space, quality acoustics, thermal comfort and natural light. It is the more complex and subtle features that make the difference—flexible use of space, ensuring student safety without the end-product looking like a prison, creating environments that are both stimulating and calm, and meeting the sensory needs of ākonga. Findings in this research are for, with and by professionals who teach, build and fund these physical learning spaces.

**Project outputs**
This project culminates in a detailed written report outlining key design aspects underpinned with valid explanations about why they are important. The portfolio, presented within a series of appendices, is a visual representation of plans and stages of the Oromahoe build internally and externally alongside positive design features at other schools and Early Childhood Education (ECE) centres. Consultation processes, synthesis of focus group discussions and interviews, and a literature review provide further evidence to substantiate the findings. Recommendations presented in a summary with bullet points are included as a quick reference guide. I have also documented how my framework of professional practice has changed as a result of this research.

**Situational analysis: Background of Blomfield and Oromahoe**
The Ongoing Resourcing Scheme (ORS) is for students requiring intensive specialist support at school. These students have ongoing severe or extreme difficulty in a number of areas that include learning, hearing, visual, physical, and language use or social communication (MoE, n.d). Whānau have the option of enrolling their son or daughter in either a mainstream or specialist school, but ORS funding is required for the latter. Blomfield is located in Northland, an area of 13,789 km, where, since 2010, the number of ORS-funded students has risen from 247 to 458, an increase of 85% compared to 36% for the rest of New Zealand (Education Counts, n.d). This growth rate is attributed to high levels of poverty, drugs and other associated issues (J. Ekart, personal communication, 23 March, 2021). In Auckland 40% of ORS-funded students attend specialist schools as opposed to 20% in Northland. This lower attendance rate is partly due to Blomfield being the only specialist school in the region.

Blomfield has a central-campus and three satellite units at host schools in Whangarei with two further units in Kaitaia but nothing in between. A few students from the Mid-North travelled over an hour each way to access the central-campus which set a precedent. Enquiries for enrolments reached a point where, in 2017, a demand analysis for this area was undertaken by the MoE (See Appendix A). Additional information included the families’ reasons for choosing a specialist school enrolment, population projections and what Blomfield’s roll was doing at the time. Five additional teaching spaces were approved for Northland by the MoE,
two of which were allocated to Oromahoe. The location of three other classrooms were still under discussion at the time of writing.

Blomfield’s principal and a team from the local MoE office visited a few potential host schools that were centrally located in the Mid-North. Moereva School had a few empty classrooms that could have been repurposed and the principal was very positive about this going ahead, however this was declined by the MoE with no specific explanation provided. Pakaraka School was another option, but it is on a state highway with fencing that could be easily scaled by students. The third option was Oromahoe School which is well off the main road, with a welcoming principal and similar ethos, partly from being a former Steiner school, a fact that the principal of Blomfield believed could lead to a synchronicity.

The next stage was a collaborative process between Oromahoe School, Blomfield and the MoE, who brokered the initial stages. The principal at Oromahoe School, put the case forward to her Board. In her words, “Everyone talks about inclusivity, that’s what society is like, so why would schools do it differently?” Board members and the principal visited Blomfield in Whangarei to gain an understanding of what was involved as a host school. An old schoolhouse which had been gifted to Oromahoe School was removed to create space for the satellite unit thereby alleviating any concerns about losing too much of the school grounds. Their students need trees and space to play without being crowded with buildings. The Blomfield Board were worried about stressors associated with a new build. All stages of the formal process from inception, planning and design to approval and construction took longer than anticipated. In the case of Oromahoe this equated to at least five years.

Risk analysis: Needs of students attending
This risk analysis is focused on the students enrolled at Blomfield living in the Mid-North who travelled to the central-campus in Whangarei while the unit was being built at Oromahoe School. It is based on my prior knowledge of students, discussions with key staff and personalised learning plans (PLPs) that are co-constructed by their kaiako and whānau.

The students currently enrolled at Oromahoe have been diagnosed with a range of additional needs that include autism-spectrum disorders (ASD). This neurodevelopmental disorder is characterised by impairments of social interaction, social language and communication, and repetitive behaviours or interests (Sousa, 2007). ASD alongside global learning delays is common amongst the ORS-funded students we work with at Blomfield. Students attending Oromahoe can at times present as highly anxious, defensive, and disconnected to the world around them. Common needs and goals identified by whānau, kaiako and specialists focus on student safety and personal wellbeing; and increasing the students’ ability to self-regulate, communicate needs and emotions, and participate in activities.

One area of concern is the safety of some students who are determined to find a means of escape. These students wear wander-trackers and require constant supervision especially when outside. They are very adept at finding objects to push against fences to scale them and finding finger-holds between palings or running if a door is left open. Other students would also wander off if they were in an open environment. For this reason, secure fencing with nothing climmable within reach and lockable doors at exit points are required alongside the ability for passive supervision at all times.
When some ākonga feel overwhelmed, unable to release energy, or become agitated this can lead to physical outbursts resulting in injury to others, self-harm or damage to property. Physical learning environments need to be robust and set up with quiet as well as stimulating spaces. A high staffing ratio, knowledge of students’ triggers, meeting their sensory needs, providing spaces for withdrawal or distraction with equipment, or fun activities can help to reduce these incidents. ASD students have a high threshold for registering sensory input, which means they need a lot of it before they respond. This necessitates a range of equipment for messy play, rhythmical or repetitive movement of large muscle groups, vestibular stimulation, and deep pressure therapy. Designing classrooms and playgrounds with enough space for students, staff and equipment is critical. Meeting their sensory needs means their foundation is secure and they can engage in learning and play. According to the physiotherapist at Blomfield, if we can improve students’ motor skills, we can improve their participation and if we can improve their participation in play and physical activities this opens doors for socialisation. Any opportunity to interact and communicate with each other in meaningful contexts is a positive outcome. By creating a physical learning environment at Oromahoe that is not only fit for purpose, but well-equipped with a wide range of sensory and play-based resources students will be able to reset on a regular basis throughout the school day and engage in learning. In this way, education is learning for all, not just some or most (Bishop, 2019)
Chapter Two: Literature Review

The first section of this chapter focuses on the users of buildings, the most important of whom are the students themselves. Teachers play a critical role in facilitating how well students learn and develop throughout their school life. Support staff, administrators and school leaders are included as teachers in this report. Change-management and consultation are critical elements connecting staff and students with school environments, providing them with a sense of ownership and belonging. The second section explores all aspects of school design drawing together best practice models including cultural and sustainable elements, and looks at specific design features that support students with additional needs. This chapter ends with a brief analysis of MoE guidelines and building codes that set parameters all schools must follow.

I have been fortunate over the last six years at Blomfield to have had extensive professional development beyond this research project. Russell Bishop and Barry Carpenter are two key experts who are central in Blomfield’s ongoing review and refinement of its curriculum and pedagogical practices. This project has introduced me to New Zealand researchers such as Mark Osborne, John Hattie, Gabrielle Wall and Melanie Riwai-Couch who, together with international experts, have provided me with a rich source of data for this report.

Inclusive education

It is pertinent to open this chapter with a note about inclusive education which some believe refers to students with high needs attending mainstream schools. Others see it as a practice rather than a place and the latter is my opinion. Hattie (2009) believes mainstreaming is often argued for based more on equity and social justice than in terms of optimal learning. As Carpenter (2016, p.1) states so succinctly, “Special schools are a part of the education system, not apart from it. Their role should be innovative, creative and ground-breaking”. Nel (2017) believes specialist schools are resource centres as well as service providers which is the case at Blomfield.

Students with additional needs

Students with complex learning difficulties and disabilities (CLDD) are an infinitely diverse group, but what they have in common is vulnerability in multiple areas of their lives (Carpenter, 2018). Disabilities often coexist alongside conditions such as attention-deficit hyperactivity disorder (ADHD), seizures, and global learning delays (Specialist Schools and Academies Trust, [SSAT], 2010). Students with learning difficulties need more time and guidance to rehearse new learning in order to determine sense and meaning (Sousa, 2007).

Many students at Blomfield have overlapping diagnoses which means statistics quoted go beyond 100%. Data are maintained to look at trends and needs, and are quite dynamic due to student movement. At the time of writing the student population was approximated to be 80% autistic-spectrum disorder (ASD), 20% wheelchair use and/or mobility issues, 6% rare chromosomal abnormalities, 6% common chromosomal abnormalities (i.e. Down syndrome) and 7% foetal alcohol syndrome (FAS). The most common diagnosis either in isolation or overlapping is global developmental delay (GDD) for over 80% of our ākonga (Blomfield Specialists, personal communication, 26 August, 2021). Given that 100% of the students currently enrolled at Oromahoe have ASD, this is a group of students that I have paid particular attention to within my research.
Autism

ASD is thought to affect more than 40,000 New Zealanders (MoH & MoE, 2016, p.21) and is one of the most challenging neurodevelopmental disorders (Khare, & Mullick, 2009). It is defined by the presence of a triad of social impairments—difficulty with social communication, difficulty with social interaction and impaired ability to think and behave flexibly which may show as restricted, obsessional or repetitive activities (McAllister & Maguire, 2012; MoH & MoE, 2016; Sousa, 2007; Srinivasan et al., 2014). Students with autism find it difficult to engage in pretend play or abstract or imaginative thinking, and often need to be taught the unwritten rules of school life including what to do where, when and with whom (MoH & MoE, 2016). Of note is the Māori word for autism, Takiwātanga, which means ‘in his or her own space’ (Riwai-Couch, 2021).

Many individuals with ASD exhibit sensory dysfunction with the two most common categories being hypersensitivity leading to sensation avoidance, and hyposensitivity which is a reduced perception of sensory stimuli. Both can occur in the same individual and vary in different circumstances (Brooks, 2010). Sensory stimuli affect seven senses within the body including vestibular, tactile, proprioceptive, visual, auditory, gustatory and olfactory senses (MoH & MoE, 2016; SSAT, 2010). If the environment is sensorily overloaded this can lead to anxiety and trigger the fight–flight mode, which in turn interferes with achieving a calm emotional state required for effective learning (Sousa, 2007). Rocking, hand flapping and stimming are involuntary coping strategies. Distractibility, agitation and difficulty processing information can be due to the inability to block out irrelevant information from their surroundings (McAllister & Maguire, 2012). Ten percent of ASD students have islets of ability or splinter skills (exceptional ability in a very narrow area) that are often related to preoccupations or obsessions which reflect information processing skills (MoH & MoE, 2016).

Students with autism can also suffer from additional social and physical challenges that include obesity due to low physical activity, poor nutrition, medication and metabolic abnormalities (Beatson, 2021; Srinivasan et al., 2014). Up to 50% of students with classic autism have no verbal language or limited functional language which is closely connected with the development of social behaviour. This can result in challenging behaviour as a means of getting their needs met (SSAT, 2010).

Mental health

Mild and transient mental health problems affect 30–40% of all children at some point whereas mental disorders—anxiety, ADHD and autism; and mental illnesses such as severe depression, and eating disorders affect a smaller number of young people (SSAT, 2010). Children with learning disabilities are six-times more likely to have mental health issues (Emerson, & Hatton, 2007 as cited in SSAT, 2010) and adolescence compounds this further. There is often a “masking” of underlying mental health conditions with the presence of an intellectual disability leading to long periods of time when unusual or atypical behaviour is undiagnosed (Coughlan, 2011).

Cerebral palsy

Cerebral palsy (CP) is the most common motor disability in young children. Worldwide the prevalence ranges from 1.5 to 4 per 1,000 births (Ballington & Naido, 2018). Lack of physical activity can lead to adverse health conditions. Children with CP are a diverse group and even
with the same motor function classification they can still show different patterns of mobility in different settings (Furtado, 2015). This has major implications for the layout of buildings and provision and storage of equipment used for physical therapies.

**Down syndrome**

Down syndrome is a genetic condition that affects lifelong development physically, cognitively and emotionally. Muscle hypotonia, shortened limbs and loose ligaments result in issues with mobility, posture, poor reflexes and reduced motor skills (SSAT, 2010). Compact bone and soft tissue structure of the ear can affect hearing and speech, with increased susceptibility to upper respiratory and sinus infections as well as heightened sensitivity to sounds and vibrations. Wandering or running-away is also common. Compulsive behaviour is no different to that of typical children at the same mental age however the intensity is often greater and compounded by higher levels of anxiety leading to more rigid behaviour (Down Syndrome Association, St Louis, 2014).

**FASD and parental substance abuse**

According to Vorgias & Bernstein (2021) FASD encompasses a range of physical and neurological effects due to prenatal exposure to alcohol that is irreversible. Neuroscience shows the brain’s parietal lobe is significantly reduced resulting in difficulties in executive functioning, sensory processing, social communication and impulse control as well as delayed physical, emotional and cognitive development. O’Malley (2007, as cited in Carpenter, 2019) believes children with FASD are true clinical masqueraders and ADHD is their most likely “disguise”. A further complicating factor is the learning profile is “spikey” and often variable from day to day.

Foetal development can also be affected in utero by a mother’s use of legal and illegal substances whilst pregnant and in early stages of a child’s life. External factors such as multiple drug use, socioeconomic status, lack of caregiving ability or neglect make it hard to ascertain the effect of substance alone (SSAT, 2010). Approximately 1% of New Zealanders have used methamphetamine in the previous 12 months with the highest rates among young people, Māori, and those in low socioeconomic areas (Bax, 2021). The growing number of “meth” or “P” babies in Northland is a major concern for schools with long-term side effects including delayed development, irritability and difficulty concentrating.

**Chromosomal abnormality**

One in every 200 babies is born with a rare chromosome disorder (SSAT, 2010). Even if there is a diagnosis, they could be one of a handful of children in this country, maybe even worldwide. Fragile X is the most common inherited form of learning disability (Carpenter et al., 2015) ranging from mild to severe with additional difficulties similar to students with ASD. Approximately 70–90% of boys and 30–50% of girls with fragile X syndrome also have ADHD (SSAT, 2010).

**Teachers**

Buildings on their own are not enough, teachers as change agents and directors of learning is what really counts (Hattie, 2009; Osborne, 2019). Teachers with high levels of relationship skills and teaching skills elicit learning by enticing ākonga to engage (Bishop, 2019). They infuse activities with enough emotional charge, taking into account the learners’ preferences, abilities, sensibilities and culture (Lacey et al., 2015; Riwai-Couch, 2021). “Inquiry is the cutting
edge of practice and centres on the child and their needs by identifying hurdles, implementing interventions, reviewing the outcomes and modifying approaches” (Carpenter et al., 2015, p128). When teachers take a dialogic interactive approach with students it lessens the distance between home and school (Bishop, 2019).

Teachers collaborate with colleagues from other disciplines to deliver holistic child-centred programmes (Benade, 2019). Specialists, behaviour analysts and medical professionals identify barriers that may be invisible to educators and advise on changes that extend educational possibilities (Carpenter at al., 2015). When everyone involved from support staff to specialists have common values, goals and expectations the students benefit (Bishop, 2019). Creating responsive partnerships with families builds a bridge between home and school, providing consistency. Whānau are the true pioneers who are often deeply knowledgeable about their children’s conditions and can help kaiako verify their interpretations (Lacey et al., 2015; MoE, 2015c, Riwai-Couch, 2021).

**Change-management**

It takes time for teachers to understand the need for change and adapt their processes. The graduation and duration of change is important to minimise negative experiences and retreat to default practices (Bradbeer et al., 2019). When change happens in a facilitated manner, teachers maintain a sense of agency, have time to experiment with alternative approaches and develop willingness and openness (McEntee, 2016; O’Reilly, 2016). It is not enough to simply place kaiako in a new environment and expect them to alter their practices as a result. When teachers have opportunities to consider the role of physical environments within the planning process and reflect on their spatial competencies they will in turn increase good pedagogies (Mahat et al., 2018; Wall, 2016a).

**Consultation in the planning process**

Attitudes and opinions of students, teachers, school leaders and families are a vital link between the environment and learning so it is important to consult with them (Commission for Architecture and the Built Environment (CABE), 2010; Department for Children, Schools and Families (DFSC), 2014; Department of Education and Training, Victoria, 2016; Education Review Office (ERO), 2018; Woolner, 2010). User-centred design connects to how buildings perform and requires participatory consultation to prevent a disconnect between designers, researchers and educators (Mahat et al., 2018; McAllister & Maguire, 2012; Schleicher, 2018; Tanner, 2000). Osborne (2016) believes design needs to start with the aspirations and needs of learners and their whānau. The success of new buildings relies on users being able to articulate and operationalise their vision for schools based on their ethos, values and wishes for future users. Heath (as cited in SSAT, 2015 p 137) sums this up: “Decide what you can live without, but be utterly unreasonable about what must stay”.

Using visual and spatial methods for consultation expands communication beyond verbal understanding and broadens who participates. Picture-sorting, diamond-ranking, and map-based activities in conjunction with discussions will triangulate participants’ perceptions culminating in deeper understandings of the complex functioning of schools (Woolner et al., 2010). “You will be encouraged to consult massively. By all means do, but accept that in doing so you will not please all or any… Most importantly design so your successors will not ask the question, ‘What were they thinking when they built that?!’ Jackman (as cited in SSAT 2015, p.122.
Pedagogical practices for students with additional needs

No single approach is the most appropriate (Lacey et al., 2015; MoE, 2017). Inclusive pedagogy occurs when programmes and activities are personalised around students’ interests, abilities and co-created goals (Bishop, 2019; Bradbeer et al. 2017, Mahat et al., 2018, MoE, 2017; Osborne, 2016; O’Reilly, 2016). While there is extensive research and educational guidance on individual disabilities, coexisting conditions mean teaching interventions are not always compatible and can leave educators unsure which approach takes precedence (Carpenter, 2018). What a child can do becomes obscured by what they cannot, but when educators focus on students’ strengths and interests they release motivation and unlock curiosity.

The gateway to learning and the best predictor of positive student outcomes is maintaining engagement. This occurs when students interact and respond with the environment, materials and people rather than just being present during activities (MoH & MoE, 2016; Brooks, 2010; SSAT, 2010). Learners who are engaged in playing, trying things out, talking and problem-solving are more likely to make better sense of the world around them (Lacey, 2015). The challenge in working with students with complex needs is often penetrating the mask of disengagement and constructing learning readiness that has eluded them (Carpenter et al., 2015). The key to liberating intrinsic motivation is establishing a warm, sensitive and responsive relationship in conjunction with personalised learning experiences that are cognitively challenging and moulded directly around each child (Bishop, 2019; MoE 2017).

Students with autism, ADHD, FASD or Down syndrome often struggle with processing language or auditory information indicating the need for visual information and kinesthetic learning. Spontaneous communication and social development in natural settings leads to ongoing positive interactions (MoH & MoE, 2016) and the use of augmentative communication supports existing speech and aids multimodal communication including gestures (MoE, 2015a). The environment needs to be adapted to increase the amount and accuracy of intentional non-verbal language. (Lacey et al., 2015).

Habitual challenging behaviour is an attempt to control the environment and can stem from communication difficulties, social attention, avoidance of difficult or boring tasks, access to tangible items and rewards or generation of sensory stimulation (MoH & MoE, 2016). Positive behaviour practices involve communication-based nurturance and wellbeing experiences (Lacey et al., 2015). Khare and Mullick (2009 p. 56) state, “Every child’s behaviour is impacted differently, but all are first learners and second disabled”. So by asking what the child can do to achieve the same benefit shifts the focus from eliminating behaviour to learning appropriate ways to communicate while recognising their right to have their own goals.

Students with special needs often struggle to play in recognisable ways especially with peers but it is rare to find a ākonga who does not display playfulness in some form. Playfulness is the outward expression of positive feelings and provides insight into how learners interact with their external environment (Lacey et al., 2015). When students experience a positive connection and remember they had fun, they will want to repeat the activity and interact with that person again. Play is not only important for developing social connections and positive emotions, it gets students physically moving. It is important for educators to allow movement breaks and calming sensory activities throughout the day (MoH & MoE, 2016). The amount of
time spent exercising correlates with engagement in class (Srinivasan et al., 2014). Lang et al. (2010) agrees with this finding stating that components of regular exercise reduce stereotypy, aggression and off-task behaviour.

Across the range of students with CLDD there are common patterns of behaviour and needs to cater for in classroom environments. The challenges that these students face include gross and fine motor skills, social interactions, emotional regulation, cognitive functioning, sensitivity to the physical environment and people around them, anxiety and distractibility. Many of these students need additional assistance with personal care and daily living skills and often also have quite complex medical conditions. Catering for needs that often conflict pedagogically, keeping students and themselves safe and having an in-depth understanding of learners and their abilities and triggers are all part of daily life for teachers and staff working in specialist schools and mainstream classes.

**Physical learning spaces for all students**

Quality learning spaces act as a second teacher or three-dimensional textbook especially where there is student agency and a sense of belonging and motivation to learn (ERO, 2018; McAllister & Maguire, 2012; Schleicher, 2018). Teachers and students co-create, re-purpose and re-fashion their physical environment in safe and positive ways to match specific learning goals or activities. In this way space is not a thing but a dynamic process (Benade, 2019; Mahat et al., 2017). A positive person–environment–behaviour relationship occurs when individuals are challenged through zones of adaptation, but not to the point of being under pathological stress (Khare & Mullick, 2009).

Currently two-thirds of learning in New Zealand takes place in traditional classrooms (MoE, 2015) and with significant public funding being invested in new school buildings and refurbishments featuring flexible learning spaces (FLS), the role of space has become pertinent (Tanner, 2000). Researchers in education and design debate how much physical learning environments impact teaching and learning due to limited empirical studies (Blackmore et al., 2011; Bradbeer et al., 2017; Byers et al., 2018; Gislason, 2010; Hattie, 2009; Velissaratou & Blyth, 2017). The innovative learning environments and teacher-change research project (ILETC) explored connections between physical environments and teaching and learning in Australasia. Their emerging data support more recent research indicating FLS positively impacts student learning outcomes especially when blended with technology. (Byers et al., 2018; ERO, 2018). Whether classrooms are traditional or flexible spaces, getting the basics of well-designed learning environments right is critical with respect to correct temperature, ventilation, lighting, acoustics and links to nature (CABE, 2010; O’Reilly, 2016; Osborne, 2019; Wall, 2016a).
Cultural design considerations
Schools are places where culturally located sense-making processes and knowledge are validated and developed collaboratively. This involves moving beyond surface displays of Māori culture to deep engagement with biculturalism and the Treaty of Waitangi (MoE, 2020b; MoE, 2020c; Osborne, 2016; Wall, 2016b). When kaiako create a family-like context, ākonga can be themselves (Bishop, 2019) and feel at home especially if they see their own culture, language and world views valued (Osborne, 2016; MoE, 2017). Ensuring comfort is an important element of manaakitanga so furniture provided should be suitable and comfortable for a range of heights and sizes (Wall, 2016a). Flexible spaces that can be expanded for large events such as kapa haka and other forms of performing arts are crucial. Interacting in smaller settings is also something Māori ākonga appreciate as it reduces their fear of making mistakes in front of others (Bishop, 2019).

People working with Māori learners with special needs should not make assumptions about what is culturally appropriate for these students (Bishop, 2019; MoH & MoE, 2016). The same can be said of students from all ethnic minority groups. Educators do not need to know everything (MoE, 2015c) but need to know who to ask and what to ask about tikanga Māori (Macfarlane et al., 2007). The culture of schools is a climate in which people work together in culturally responsive ways. Pumanawatanga (morale, tone and pulse of kura) is promoted through relationships, effective pedagogical practices and by the design of the physical learning environment.

Sustainable design
Schools play an important role by demonstrating to students and the wider community how to live sustainably with buildings (CABE, 2010). Minimising running and whole-of-life costing must be a driving factor in design (DFSC, 2014). Reducing energy costs using sustainable technologies alongside solutions such as maximising natural ventilation and optimising glazing for natural light have long-term cost benefits as well as positively impacting the well-being of the users (Jackman, as cited in SSAT 2015). Any capital investment that is affordable and reduces operating costs is highly worthwhile.

Designing learning spaces for students with additional needs
Varied spaces within buildings give autonomy and choice by providing quiet and noisy zones, play areas and work areas, and spaces for social participation or withdrawal (MoE, 2017). This needs to be balanced with the ability for staff to supervise students at all times. Wall treatments, ceiling heights, colours, open or enclosed spaces and visuals all provide clear physical structure, predictability, and boundaries for students (CABE, 2008; Khare & Mullick, 2008; Lacey et al., 2015). Spacious rooms are necessary to ensure ākonga are not overcrowded and have space to co-exist harmoniously, especially for those with tactile and proprioceptive dysfunction (Brooks, 2010). However, if buildings are too large students can feel overwhelmed and insecure (Tanner, 2000). Appropriately scaled rooms with lower ceiling heights and intimate learning spaces create a sense of security (Myer et al., 2003).

When aesthetic quality and functionality are given equal attention, accessibility is present but not obvious at first glance (Bordas, 2018). The quality of environments gives messages about the value and expectations of schools and promotes a sense of wellbeing (Maxwell, 2016; Porter, 2018; DFSC, 2014). Inclusive design is not an optional add-on but the essence of good design where all students can access education free of any barriers (MoE 2020b). There is a
broad range of features identified by researchers that creates an environment that is safe and enabling for students with additional needs. These features include layout, breakout spaces, outdoor learning areas, acoustics, ventilation, lighting and furniture (see Appendix B).

**MoE guidelines and building codes**

It is beyond the scope of this thesis to document all MoE guidelines and building codes in detail. The main point to highlight is MoE owns the buildings, funds all projects and sets each school’s space entitlement based on student numbers and architects, project managers and schools must work within these constraints. Designing Schools in New Zealand—Requirements and Guidelines (MoE, 2015a) is the leading document that clearly and succinctly mandates all processes and compliance requirements as well as design principles. The National Curriculum (2015b) sets the direction for learning, and physical learning environments must support these visions. All school projects must meet established legal and regulatory standards and be efficient, durable and cost effective. The MoE’s design regulations reflect the special nature of school buildings so some of its standards go above and beyond building-code requirements. Base schools for students with complex needs and satellite units sit within this framework with additional space entitlements, technical specifications and features such as more universal bathrooms. The MoE’s Learning Support team works in conjunction with their Project Leaders throughout the design-and-build process to ensure the needs of all ākonga are met. MoE has appointed a national working party to create a set of guidelines for learning spaces for ORS-funded students that, at the time of writing this report, is not complete. I will be interested to see how my findings overlap and potentially support this process.

**Chapter summary**

There are some common challenges students with additional needs face that must be factored into design briefs. These include sensory impairments, the need for greater personal space and social and behavioural support, mobility issues, and ensuring safety whilst not limiting independence. “There is an intricate interplay and delicate balance between environmental factors and human factors that converge to create a space when children can be children— not just children with a disability” (Whitehurst in Sunfield, 2006, p. 38). Conventional educational environments are associated with a complicated and unpredictable array of sensory experiences (MoH & MoE, 2016).

Universal and inclusive design principles put children at the heart of the process and are about dignity and respect (Department of Education and Training, Victoria, 2016; DFSC, 2014; MoE, 2020b; Reidel & Mahoe, 2019). They require attention to the ways that people interact and experience the designed environment rather than a one-size-fits-all approach to architecture (Barrett et al., 2013; Osborne, 2016; Porter, 2018). At Blomfield we support our students in discovering their potential and the physical learning environment is an integral part of this process. My role as Property Coordinator is unique and reflects the school’s prioritisation in its strategic plans to ensure the delivery of quality designs that are fit for purpose.
Chapter Three: Methodology

This chapter explains the underlying methodologies I used to gather and analyse data as an inside-researcher with emergent knowledge. The overarching goal of this study was to explore how existing national and ministerial design guidelines support or challenge teaching and learning for students with additional needs. My rationale for utilising a qualitative approach was that with only 30 specialist schools in New Zealand (both day and residential schools) the pool of professionals with expertise in this field is narrow and education as a whole is rapidly changing. According to our project manager at Avail Pacific, we are working with a brand new lens, and building the evidence as each new specialist school is built. It is not possible to start with a scientific rationality where answers are not known. Qualitative research focuses on subjective experiences and interpretations of all stakeholders and generates practices that can be tested out, critically reviewed and modified (Lacey, 2015).

Research-as-practice according to Hamilton (2005, as cited in Green, 2009) is combining discovery with speculation where researchers probe into the unknown. The participatory nature of action research enabled me to gather contextual real-world knowledge. Through a cyclical process of planning, action and reflection I gained knowledge and skills that improved my professional practice and brought about positive changes in the way that the leadership team at Blomfield approached various design aspects of new-builds and renovations. I hope these findings will support the wider community of practice as they are shared. Green (2009) believes that the focus of case studies is not on production but on consumption. With increased proliferation and re-reading, use, circulation and accumulation it becomes a qualitative meta-analysis.

The central case study in this research project is the Blomfield satellite unit built at Oromahoe School. I was directly involved in a range of decisions throughout the design process, some of which I reflected upon and later viewed with a different lens. I had only just begun my Master of Professional Practice when final plans were submitted to Far North Council for approval so my knowledge was emergent. Design of the external learning area, fencing, furniture and equipment took place at a later stage and formed the part of this project where I had the opportunity to make decisions based on research. This learning journey is documented in my reflective summary, appendices and written report.

To gain insights into best-practice models and lessons learnt outside my organisation I visited three specialist schools and three early childhood centres that were recommended by colleagues. This gave me the chance to take photographs and discuss positive aspects of respective learning environments. I collected primary data via discussions with professionals in the wider community who were fully aware I would synthesise their views within this report. These professionals included three specialist school principals in Auckland with extensive experience in the design and build process, MoE property managers and occupational therapists who work with a broad range of schools in Auckland and Northland, and the architects who designed our unit and modular classrooms, as well as our project manager. Additional discussions were undertaken with three specialists at Blomfield, two teachers who are employed at the unit and the principals of Blomfield and Oromahoe School.
Family-members of six out of nine of the students attending the unit also took part in a cultural consultation hui. I was guided through this process by our Māori Team Leader, and outreach teacher. Invitations and a summary of all discussions were sent to all participants via email. Undertaking a collaborative process and providing this feedback loop to whānau was an important aspect of cultural consultation highlighted by Kaitohutohu (see Appendix C). This hui and all ensuing discussions with principals, school staff and key professionals were unstructured to capture the unique nature of each person’s experiences and knowledge. I used Otter, a voice-to-text app, which generated an accurate record. Following minor editing a copy was sent to each person within a week for their approval.

Qualitative data was collected from four focus group discussions. Five members of the PCG discussed the inception and design of Oromahoe, two separate groups of Blomfield staff discussed challenges and positive aspects of the transition building and one group focused on cultural aspects of the learning areas. I sent an explanation of three different focus group topics to the teachers and specialists, and the leadership and administration teams. Members of the Blomfield Board were invited to these discussions but did not attend. I summarised my project and purpose of the discussions, included a list of key questions and attached the consent and information forms approved by the Ethics Committee (see Appendix D). These emails were sent two months in advance with a couple of follow-up reminders. Teachers were asked to share my email and invitation with support staff in class discussions. I followed up personally with each person who had volunteered, to make sure they were comfortable with taking part.

Challenges I encountered getting these groups together included rescheduling due to COVID-19 lockdowns, finding a day without other meetings or commitments after school, and getting buy-in from staff who already felt overcommitted with their workload. The Principal suggested meeting support staff, specialists and the technology teacher at an earlier time and they were released during school hours. The transition teachers and Deputy-Principal took part in a discussion at a later time on the same day. Discussions were recorded and transcribed with the Otter app and a copy was sent to everyone with the chance for feedback. All transcripts will be stored for seven years.

The literature review was a search for knowledge beyond my work-based learning and raw data. A brain-storming session at the beginning of this project created the filter and keywords used in seeking relevant information related to building and playground regulations, MoE documents, pedagogical practices, national and international best practice models for inclusive design, cultural considerations and the range of disabilities and complex needs of our students. According to Costley et al. (2010) a literature review aims to show how theory relates to practice, uncovers unfamiliar or contrary ideas, and presents a project relative to prior work; I believe that I achieved this.

At the heart of this project was work-based learning that emerged through my involvement with Oromahoe, prior knowledge of ākonga who attend Blomfield, and discussions with their staff. Other aspects of my job that were relevant to this research project are documented. These include the design and resurface of the central-campus playground, daily property maintenance and being involved in designing Blomfield’s Kamo High School satellite unit (hereinafter referred to as Kamo). This research project made me conscious of multiple
opportunities that arise for learning. "Experience must be processed in order that knowledge can result from it". Mason (2000, as cited in Moon, 2004 p 113).

I used a thematic and iterative approach to analyse and reflect on data collected and I identified common themes that came up repeatedly in discussions, research and first-hand experiences, including consultation, safety, building layout, and outdoor learning areas. These themes will be discussed in greater detail in the following chapters. Srivastava and Hopwood (2009) refer to iteration as being key to sparking insight and meaning where categories are driven by what researchers want to know and their interpretation. Action-research enabled me to make assumptions, plan and act accordingly, research, and reformulate my ideas through reflection. Moon (2004) refers to this process as perspective transformation. To reflect on something is to bring it into ownership. The methodologies, data collection and analysis in this project are aimed at exploring and presenting findings that will make a positive difference in my career, at Blomfield, and with professionals in my community of practice.
Chapter Four: Work Practice

This chapter documents key learning resulting from my first-hand experiences with school property maintenance, playground design, and planning of Oromahoe. Lessons learnt were later highlighted and applied to Kamo. While many aspects of building are defined by MoE guidelines and building industry standards, we created a unique and safe learning environment that met our students' needs. Challenges encountered included delays in construction and balancing the safety and security of students whilst meeting fire regulations, as well as working with architects who did not always consult with us or understand the needs of our students. Data gathered from consultation and professional and focus group discussions all aligned and reaffirmed what I experienced and researched for this master's degree.

Oromahoe planning and design process

I have chosen to start this section with a summary of the PCG focus group discussion because they highlighted challenges and considerations involved in building our satellite unit. Representatives of Blomfield, Oromahoe School, Avail Pacific and Bay Builders shared their thoughts. The MoE delegate was not able to attend but emailed his key message:

I think most of the questions that I would be asked to contribute would involve government processes such as procurement and funding. I think it is fair to say that there were delays in the delivery due to the above and from a learning perspective the key point would be that projects that require significant government capital should include significant time contingencies.

This statement regarding delays was identified as an issue by all members of the PCG.

Oromahoe’s inception

Members of the PCG reiterated the challenges faced by whānau wishing to enrol their sons and daughters at Blomfield. The gap in the Mid-North for delivery of special education was formally identified by the MoE in 2017. Delays were the biggest issue due to the MoE taking six months to approve funding for final plans, alongside lockdowns and supply-chain delays resulting from COVID-19. It was a long-winded process with many people involved including the MoE at national and regional levels, both schools and their boards, architects, and project managers. Decisions were needed on the placement of the unit. As the Oromahoe School principal explained, “Space was limited but we needed to find somewhere that was inclusive”. All participants agreed that if they went through this process again, they would want more paperwork confirming everything from the MoE at the beginning.

Oromahoe’s design process

The design and build process, which is when I joined the PCG, was more complex than it needed to be. The architects, who designed the modular classrooms at Wairau Valley Special School, were appointed by the MoE to draw up our plans. The preference of both schools and Avail Pacific was to use local architects who would have worked directly with the schools in creating a bespoke set of classrooms that fitted the site, the needs of students, and the region. We rejected the original design based on the modular concept and created a new design starting with squares on a piece of paper. Avail’s designer listened to what we wanted and translated our ideas into concept drawings for the architect to formalise. Ongoing discussions were needed with the MoE regarding the need to listen to Blomfield staff who knew their
students and what was required. The MoE agreed that the interior could be changed but insisted it fit within the original footprint which required compromises and made the layout more complicated. The builder, who was also constructing classrooms for Oromahoe School at a much lower cost commented, “Usually, you put a concrete slab down and build with trusses, add a roof and clad it”. Costs and build time could have been reduced by following a simpler plan.

Consensus of the group was that the original architect did not always listen or fully understand the needs of our ākonga or the wider rural Northland context. He changed elements of the original concept, which required email exchanges to reverse, and made some decisions without consultation. One example was hanging lights that were very distracting and needed changing at cost, to ceiling-mounted LED battens. Hanging lights were listed deep in the specifications which were not shared with Blomfield staff prior to submission to council. The design process for Kamo with another organisation was different. The architect listened and took on board our expertise on what was required in learning spaces for our students. We were fully consulted and provided with evolving three-dimensional plans clearly showing each part of the building for us to tweak as necessary.

PCG participants did not believe there were many design features dissimilar to mainstream school buildings except wood panelling on lower walls, the hatch from the Universal Bathroom to the laundry and, as one participant stated, “the fancy toilets”. The Oromahoe School principal believed that if her students were in our building it would work equally well. The focus group concluded with a discussion about the modular concepts the MoE is moving towards. Opinions were that these offsite manufacturer buildings (OMB) are essentially relocatable classrooms. They are potentially more expensive than units built onsite once delivery and whole-of-life costs are accounted for. It is important for designs to suit the sun and the site as well as the needs of students, instead of just being a building that fits all.

**Oromahoe plans**

Layout of classrooms, amenities and non-teaching spaces required a series of meetings and iterations to optimise space within the designated footprint (See Appendix E). The students attending Oromahoe are in their early years at school and therefore need more verbal and physical support and closer supervision due to their unpredictability and their need to adjust to being at school. When buildings are created to allow less hands-on support, students gain independence. Oromahoe was designed with these considerations in mind.

We wanted both classrooms to open to a covered deck within an enclosed playground so all students could access outdoor learning spaces whilst staff maintained passive supervision from the classrooms and staffroom. The operable wall between classrooms means learning spaces can be expanded for events and combined activities, or closed for separate class programmes. Exits from the building are limited to automatic doors at the entrance that remain locked during school hours, while remaining doors open to a fenced area. Windows facing the wider community are high or lockable. Bathrooms are in close proximity, although not accessible from outside. The corridor running the length of our unit provides a natural flow with fewer distractions than a wide, open, central learning space. Wider multipurpose circulation spaces optimise a building’s footprint and work well for older students who are more independent. Breakout spaces in each classroom provide quiet areas for ākonga to withdraw and reset or work individually with staff. Higher windows and ceiling to floor Autex make these
small rooms comforting and less susceptible to damage. Heat pumps throughout the unit individualise temperature control in conjunction with windows and ranch sliders for passive ventilation. Generous storage spaces off each classroom and shelving throughout enable staff to access equipment and resources during the day.

The satellite unit is visually calming with rural views and native bush nearby. Extensive time was spent with an artistic staff member and my niece designing large, beautiful manifestations featuring manuka, nikau and mahoe for the internal doors and the meeting and staff rooms. These opaque window dressings maintain privacy, and students’ dignity with toilets directly opposite, minimising distractions but allowing for staff supervision from the classrooms. Ranch-sliders to the deck have narrow vision-strips to maintain line-of-sight for supervision and views of nature. The designs are a blend of the three native trees, maunga and poutama that reflect the local fauna and culture whilst connecting the building with the Perspex fence panels (see Appendix F). Light-coloured walls and ceilings create a sense of space and darker floor coverings hide spills and stains. The equal balance of carpet and vinyl provides separate spaces for quiet and messy play activities. Soft-lime-coloured Autex, which is used throughout all Blomfield’s buildings, is calming, absorbs sound, and provides spaces for displaying students’ artwork.

**Internal fit out and furnishings**

The MoE allocated $41,000 for us to purchase furniture, IT equipment and teaching resources for the unit. I selected furniture that was neutral in colour, height adjustable, robust and multipurpose so classrooms can be easily reconfigured for different activities. Couches and a coffee table in the meeting room create a comfortable home-like room for whānau and visitors close to the front entrance. Interactive whiteboards in each classroom on moveable trolleys capture and engage students in a range of activities.

Students at the central campus and satellites in Whangarei can access Blomfield’s indoor heated pool, gym, a multi-sensory room and playground which encourages active play and engagement. None of these facilities are available to Oromahoe students. Most of these learners come from rural settings where access to playgrounds and recreational facilities is very limited. Fortunately, we received a $10,000 grant from Tu Manawa Trust to purchase soft-play gym equipment and a large building set. Used in combination with the swings, a large sandpit and mounds in the playground the students’ sensory, emotional, social and physical needs will be catered for.

**Landscaping and playground design**

Resurfacing of the central-campus playground provided my first opportunity to research and design an outdoor learning environment (See Appendix G). The popular mound and paths were inspired by looking at various images online. Key aspects learnt from this experience were to research and collate other people’s ideas in creating a unique design, to think of an overarching theme tying everything together, and to remember that sometimes less is more. Avail Pacific managed the project, however there were design adjustments and questions from contractors I needed to answer quickly. Regular monitoring and communication with one key person in school was important. As a result of this project at the central campus, and in combination with my research, the Oromahoe playground incorporates a large sandpit with logs for balancing and sitting, mounds, swings and a path (see Appendix H).
Fencing
Fencing for students with additional needs, especially those who like to escape and explore the world beyond school, required extensive consideration. Most schools in New Zealand use pool-type fencing which is climbable and not appropriate for our complex students. The challenge was creating something culturally appropriate, aesthetic, robust and secure without looking like a prison, which is critical with fencing a satellite unit on existing school grounds. Similar to the playground resurfacing project, designing a fence for Oromahoe involved researching existing fences, understanding NZ Fencing Design Standards, consulting the host school, and discussing the feasibility of ideas with the builder (See Appendix F). I wanted a fence resembling a Māori Pa with posts of uneven heights to reflect the culture of our region but was mindful it needed to be economically viable. Our talented technology teacher created three Perspex panels that could be inserted into the fence. These panels feature designs that incorporate ideas raised in cultural consultation along with elements of Oromahoe School’s logo.

Navigating the build process: The role of schools, project managers and MoE
The PCG focus group discussion highlighted how complex and lengthy the build process was due to the range of stakeholders and professionals at various stages. Blomfield’s principal reiterated that while consultation is critical, it is also important to find a balance so decisions can be made in a timely manner. Ultimately the MoE sets budgets and entitlements, school staff understand their students’ needs, and project managers and designers use their expertise to translate these requirements into reality. Clear communication between all parties, especially members of the PCG, architects and builders is central to ensuring the process runs smoothly.

Capturing student voice
Many of our students are non-verbal and communicate in a multitude of ways including behaviour, level of engagement, facial expressions, body language, and via visuals and symbols on high-tech and low-tech communication supports (augmentative communication). Staff and whānau through many years of interaction learn how to interpret students’ thoughts and ideas. Capturing their opinions about theoretical concepts such as building designs would be limited at best. Through observation and simple communication, it is possible to gauge reactions to different environments once a building is complete which helps inform future designs. I will be very interested to see how our ākonga connect and interact with their new unit at Oromahoe as the year progresses.

Discussions with key stakeholders and professionals in the wider community
Over the last two years I have discussed various aspects of this master’s degree and our designs with a range of professionals including specialist school principals, specialists, MoE staff, and architects. Many shared valuable insights that come from years of first-hand experiences. I sought ethics approval to include data from focus groups in my report and in hindsight should have added the discussions with professionals in that application. While I cannot formally include these conversations as data in this report or identify the people, I have summarised the notes made following these interactions (see Appendix I). Key repeating themes relating to consultation, student safety, building layout and outdoor learning spaces have emerged mirroring data from focus group discussions and my research.
Stakeholders and professionals agreed on many points, however opinions about the degree to which school designs are bespoke or standardised varied between school staff and the MoE. It is critical that schools define how to meet the needs of current and future students within the context of their local communities and pedagogical practices. If standardised cookie-cutter designs are at one end of the continuum and custom designs are at the other, it will be interesting to see which approach dominates over the next few years. It is reassuring to know that designs undergo close scrutiny when it comes to investment and that the MoE has established a working group focusing on designs for ORS-funded students including specialist schools and units. The MoE wants to take learnings from past builds, house all information in one place, and achieve some consistency with designs whilst taking into account each schools’ unique setting.

Specialist school and kura visits: Best practices and lessons learned

In 2021 I visited three specialist schools in Auckland with Wairau Valley School, being the most in-depth tour. This was of particular interest as the unit was the first MoE modular design constructed. I spoke to the teachers as I went through classrooms and to the principal, who had previously mentioned that there were issues. She explained, “One of the big challenges is that builders have contractors, and their contractors contract out to other contractors… and when something goes wrong, you don't know who to go to”. She reiterated the importance of having everyone’s contact details. The teachers were happy with the layout which felt calming and full of natural light. The unit had excellent acoustics with ceiling to floor Autex, acoustic ceiling tiles and carpet throughout. The central-circulation area was multipurpose with alcoves for individual activities and a kitchen with dining tables that folded away for physical activities. Each classroom was a reasonable size with access to a covered deck used for physiotherapy and other sensory activities. Each teacher set up their breakout spaces and classrooms in different ways to suit their students and teaching practices. Exits were controlled with keypads although the unit was open to playing fields. Furniture and dividers delineated different zones allowing staff and students to work in smaller groups or withdraw. Bathrooms were separated from classrooms by short hallways.

I felt a major drawback stemmed from the building being constructed as separate pods that were fitted together onsite. This created narrow spaces that were turned into cupboards, however these were too narrow for effective storage and created a labyrinth-type set up in the centre. (In standard classrooms trusses or beams span greater lengths within ceilings and are supported by fewer walls). The kitchen had limited power points or bench space, with appliances stacked on top of each other. This reduced functionality and the number of people who could use it at any one time. The satellite was built on a steep hill requiring extensive retaining walls on one side and high railed fencing around the deck, making it feel enclosed. Our unit may have come with a higher price tag but the whole-of-life costs and maintenance remain to be seen for both buildings.

Personalised learning plans of ākonga at Oromahoe are based predominantly on Te Whāriki Early Childhood Curriculum (MoE, 2017). I was fortunate to visit three early childhood centres in Whangarei and Kaitaia recommended as good examples of cultural inclusion and play-based learning. Outdoor learning areas were extensive with different zones that young people could choose to engage with. These included construction, sand and water-play, paths for riding trikes and scooters, swings and slides, art and craft activities, and quiet natural spaces to withdraw. Each centre encouraged free movement indoors and outdoors while staff spent
time with students on an individual or small-group basis. Each centre was fully fenced with cultural artwork dominating walls and windows. The Footprints Centre in Kaitaia uses birds to represent ages of children from small kiwis to eagles who were ready to fly. A large mural depicts geographical, historical and cultural elements of the Far-North. Kind Hands in Whangarei, catering for pre-school children with additional needs, is set up like a home. It generates warmth, comfort and a sense of belonging. I took photos and noted positive aspects from each kura I visited to incorporate into future-builds (See Appendix J).

Kamo High School satellite unit
In mid-2021 we began the third iteration of plans for a three-classroom unit at Kamo High School for our 13- to 19-year-old students. Over the past five years a number of attempts to get this project underway stalled due to internal issues at the host school. A change of principal at Kamo High and of MoE property delivery managers and architects meant hours were spent and lost changing layouts and locations. There are Blomfield students in a two-classroom prefabricated building on the far side of Kamo High School which is not fit for purpose and limits who can attend. Our unit is the first stage of the host school’s upgrade designed in conjunction with the Ministry of Architecture + Interiors. Extensive community consultation culminating in a cultural narrative informed visual and structural aspects flowing through buildings and outdoor spaces prior to plans being created. The exterior of our building blends with Kamo High School while the internal layout was our design.

The deputy principal and I created a rough-draft based on positive design aspects of our transition building, the satellite unit at Oromahoe School, and Wairau Valley School’s modular concept. We were not limited by pre-determined footprints so could place classrooms, amenities and non-teaching spaces where they maximise space (See Appendix K). The architect valued our expertise in how ākonga and staff would utilise the building, especially the class for students with high physical needs, all of whom are wheelchair-users. He took our initial concepts on board, consulted for each iteration and shared three-dimensional walk-throughs highlighting areas we needed to change. We consulted with our specialists, kaiako at Kamo, senior management, and key staff at the MoE to ensure building and internal fittings and fixtures were fit for purpose and future-proof.

Key differences between the design of Oromahoe and Kamo include the central multipurpose circulation area, minimal corridors leading to bathrooms, less glass and more walls for teaching spaces, a full kitchen and laundry accessible for students to gain functional life-skills and an outdoor area with unique fencing which was included in the initial design stage. Our unit is part of the host school’s upgrade project so there was more funding, consultation and expertise from the outset. Finally, research undertaken for this master’s degree informed many decisions made within the planning and design phases which highlights the growth in my confidence and expertise.

Cultural consultation
Cultural consultation for Oromahoe was not as extensive, partly because of COVID-19 restrictions but also due to staff managing other areas of Blomfield. Prior to the formation of the PCG there were multiple meetings between Blomfield and Oromahoe School with support and guidance from various personnel at the MoE. Initial consultation and collective understanding of Blomfield’s ākonga, their whānau and wider community informed the designs. My involvement entailed a cultural-consultation hui in April 2021 with whānau
members of students enrolled at Oromahoe (see Appendix L). I also undertook discussions with staff of both schools and parents leading to the creation of culturally appropriate artwork on Perspex fence panels and manifestations on ranch sliders.

Outcomes of cultural consultation vary according to the geographical location of schools. Oromahoe students come from all over the Mid-North where there are different hapū (subtribes) and places of cultural significance. This was reiterated by parents at the hui who agreed that keeping cultural artwork generic avoided stepping on anyone’s toes if they were not represented. This hui led to our designs with the native trees—manuka, nikau and mahoe, maunga (mountains) and poutama (stairs) representing knowledge, learning and progress. Our experiences with cultural consultation potentially contrast with inner-city schools where students come from smaller catchments with specific places of interest that can be visually represented. This year we began planning and designing a two-classroom unit in Dargaville. Key areas of learning I want to suggest to our school leadership team would be to engage with potential whānau, local marae, and key stakeholders in the area prior to designing the unit, and for me personally to follow the lead of those who have been through this process before and understand protocol.

Focus group discussions
Towards the end of 2021, I conducted four separate focus groups, and once again all participants were in agreement about key design features. Two focus groups discussed positive and challenging aspects of our ten-year-old transition building (see Appendix M). It was interesting to note that support staff commented more on the functionality of the building, its fixtures and facilities. The teachers' perspectives were more about the effect of design on students’ learning and behaviour and everyone’s safety and wellbeing. One teacher stated, “Some of our students are giants. This room was great for six students…we need to be able to move quickly or get out of the way sometimes”. The PCG focus group described the inception, design and build process of Oromahoe as outlined earlier. The cultural focus group discussions were specific to our young Māori ākonga, however points raised would be applicable to students from all cultures—creating a sense of belonging, comfort and connection, whilst still challenging the students and meeting their specific needs (see Appendix N). These were the same objectives outlined in my Cultural Consultation document submitted to Kaitohutohu (see Appendix C).

Blomfield upgrades and maintenance: Key learnings
My involvement with property maintenance has highlighted a number of elements which have been discussed throughout this report. Two major areas of note however would be the high cost and amount of time involved in repairing and maintaining schools, and how tough our ākonga can be on buildings and fixtures either through accidents or as one principal stated, “Whatever kind of creative expression of communication a student might choose to use”. My position at Blomfield as Property Coordinator is unique, however the school is experiencing a major role growth with the build of new classrooms and major upgrades. My role enables the principal and deputy principal to focus on aspects of the school pertaining to students, pedagogy and personnel.
Chapter summary
Data presented in this chapter explored work-based practices and knowledge gained through focus groups, professional discussions and first-hand experiences with new-builds, property maintenance and upgrades. The importance of using collective experiences and expertise of professionals in education, design and construction was reaffirmed. Oromahoe, which was built to meet the needs of learners in the Mid-North, took over five years to complete from its inception to its opening in January 2022. Challenges encountered include delays due COVID-19, investment reviews and a series of iterations with the design. Oromahoe is a unique well-built set of classrooms that meet the complex needs of younger students, however there are design features that could be improved based on current knowledge. Being able to apply new insights to the plans for Kamo, which began mid-2021, serves to strengthen and expand our collective knowledge thereby improving outcomes for ākonga at Blomfield and beyond.
Chapter Five: Findings

This chapter highlights relevant insights gained by connecting my work-based learning and reflections with existing research and placing it within the context of a specialist school in rural Northland. I explain how my evolving professional framework is already being applied to further building developments at Blomfield. By sharing my findings of practice and theory with the wider community of practice I hope to broaden this contribution beyond specialist schools. I conclude the chapter by discussing limitations of my findings, revisiting my motivations for undertaking this research project and making suggestions for further research.

Key insights gained through theory, practice and reflection

My work-based research project focusing on design of learning spaces for students with additional needs was a very specialised field of study and draws together theory and practice from three larger domains—education, architecture and the students' needs in specialist schools. Repeated themes discussed throughout this report are organised under subheadings and the intersection between prior research, raw data collected and my experiences provide evidence to support the findings.

Space and flexibility

The need for ample space and flexibility in classrooms centres around a few key elements that many researchers and professionals agree upon. Younger students and those who struggle with sensory regulation, need more personal space around them (MoH & MoE, 2016) with low arousal zones to withdraw and reset, or spaces to regularly move and release energy to fulfil their sensory needs (Brooks, 2010; Sousa, 2007; SSAT, 2010). There is a high staff to student ratio with more users in each learning area. Personalised programmes delivering quality education for all ākonga (Bishop, 2019; Carpenter, 2018) mean teachers and students need multifunctional areas that can be easily reconfigured for different activities to run consecutively (MoE, 2015a). Many students at specialist schools use a wide range of hands-on, and often bulky equipment, for supporting mobility and accessing the curriculum. In addition, they use communication devices and sensory, therapy and play-based resources that all need storing and accessing regularly (MoE, 2020a). The transition focus groups also highlighted these issues. Based on these findings I believe the amount of space for learning and storage goes beyond that required by most students in mainstream schools.

Researchers agree it is difficult to cater for the varied needs of students or to predict future-users or changes in pedagogical practice. As Wall (2016a, p.5) states, “Schools need to create flexible learning spaces—property that is ready for today and future-proofed”. Many principals I spoke to believe classrooms in specialist schools should be at least 70 m² to support effective learning and teaching, and to ensure the wellbeing and safety of all staff and students.

Safety in physical environments

As noted previously by Carpenter (2018), students with complex learning difficulties and disabilities are an infinitely diverse group but what they have in common is vulnerability, meaning safety within design is crucial. Quality learning spaces that are safe, calming and accessible provide clear physical structure, predictability and boundaries for students (CABE, 2008; Khare & Mullick, 2008). The key is finding the balance between providing enough space for staff and students to be safe without overwhelming learners by making areas too large, noisy or distracting (Brooks, 2010; Tanner, 2000), which could be the case in modern learning
environments found in mainstream schools. Some students have less understanding of danger or physical limits (McAllister & Maguire, 2012) and need additional security features—minimal exits controlled by staff, cavity sliding doors, unclimbable fencing, lockable storage and kitchen facilities, higher windows and robust buildings, furniture and equipment. The challenge in designing for safety is balancing security with student independence and avoiding an institutional look.

**Design of buildings and outdoor learning areas**

Quality designs are not a one-size-fits-all approach to architecture (Osborne, 2016; Porter, 2018) instead they take into account how people interact and experience the physical environment. The current issue I see happening is the MoE and schools working out how to create and utilise reference designs (MoE, 2021) or more standardised modular concepts that are meant to save time and money and ensure equity. Educators and designers need the capacity to meet the needs of their ākonga within their local communities. Budgets, entitlements and lack of space on school grounds for new classrooms mean extensive consideration must be given to optimising how each area of a school building and playground can be used.

There were many design features agreed within focus groups, and through professional discussions and prior research, as outlined in the appendices, but the elements identified as having the biggest impact were:

- Designs that are sensory-aware with high and low stimulation zones, quiet and messy activity areas, minimal clutter, quality acoustics, and ceiling-mounted LED lights. Simple designs and fittings with plain ceilings, wall treatments and flooring and neutral calming colour schemes.
- Multifunctional spaces: Breakout rooms that can be converted into multi-sensory rooms, circulation spaces wide enough to be additional learning areas, outdoor covered areas for play, therapy or withdrawal. Moveable walls to change single-cell classrooms into large spaces for events and shared activities.
- Spaces that are well-equipped with a range of sensory, physical and educational resources to provide motivation and novelty through repetition. Extensive storage and access is needed.
- Robust building materials, equipment and furniture to minimise damage and injury caused through accidents or challenging behaviour. When buildings are maintained to a high standard, staff and students feel valued.
- Naturalness and controllability of heating, lighting and ventilation to cater for variations in activities, comfort levels and optimise environmental factors which reduce operating costs (MoE, 2020a; Barrett et al., 2013; BRANZ, 2016)
- Careful use of glass especially at lower levels on doors to avoid damage. This is a fine-balance of visibility, views of nature and natural-light versus privacy, distractions and glare.
- Toilets that are evenly distributed around school and of an adequate size for staff assistance and larger students. Separate hallway entrances and good ventilation maintain students’ privacy and dignity.
- Floors and walls that are easy to clean with hand basins in every classroom and well equipped laundries.
- Furniture that is easy to clean, is comfortable and of varied sizes or adjustable to cater for the range of body heights, weights, mobility, sensory needs and activities.
• Quality outdoor learning spaces designed from the outset that meet students’ needs with covered areas that can be accessed in all seasons.

Cultural design considerations
Key findings of Wall’s research (2016a, 2016b) highlighted the importance of extensive consultation, cultural visibility and flexible learning spaces. The cultural focus group agreed and discussed additional elements that included the visibility of written word and cultural art forms, comfort for learning, integration with the natural world, and maintaining connections with local maraes and iwi in the wider community. By embracing the tikanga of Ako (reciprocal teaching and learning), designers and staff become visitors in someone else’s cultural space (Macfarlane et al. 2007). Students need to see their culture, language and world views valued (Bishop, 2019; MoE 2020b) in conjunction with teachers building family-like relationships in a safe environment.

Consultation
User-centred design starts with the aspirations and needs of learners, (Osborne, 2016) connects to how buildings perform, and needs participatory consultation to prevent disconnection between designers, researchers and educators (Mahat et al., 2018; Scheiler, 2018). School staff, students and whānau are the link between learning and the environment so it is important to capture their views and expertise and impart ownership (ERO, 2018; CABE, 2010; DFSC, 2014). While it is important to collect and assimilate everyone’s views, two key factors remain: firstly, you will not please everyone, especially if you focus on current-users and pedagogical practices, and secondly decisions need to be made in a timely manner.

Oromahoe: The central case study
Oromahoe was built to meet the needs of primary-age ORS-funded students living in the Mid-North. A lengthy but collaborative process culminated in a two-classroom unit that is fit for purpose. It has many of the design features already discussed—a safe and secure building and playground, sensory awareness, flexible and multifunctional spaces, robust materials, naturalness and controllability as well as being equipped with a range of resources, cultural visibility and a well-designed playground with a wide covered deck. Aspects I would alter for future satellite units would be a wider corridor to allow for storage or a central circulation area for older students, toilets off separate hallways, more internal wall spaces with less glass, and a more secure entrance. This research project has spanned the entire planning and design process for Oromahoe and the knowledge and skills I gained are already informing other new-builds and renovations.

Contribution to Blomfield and beyond
I am fortunate to be able to apply my new knowledge and skills to a range of projects beyond Oromahoe. We started planning for Kamo in 2021. Some of the central-campus buildings are being renovated while its playground was resurfaced last year. A two-classroom unit at Dargaville starts in 2022. Key findings identified in my research inform the layout of each project. I have applied lessons learnt from Oromahoe’s inception and planning—ask architects more questions at each stage, focus on all details within the specifications prior to council approval, consult earlier with key stakeholders, involve artists and staff creating designs from the beginning, expect delays and budget constraints and be ready to make decisions as they arise. By applying this new knowledge, I hope that variations are reduced, planning processes are quicker and the design of learning areas is founded on the latest research. By sharing the
findings and outcomes with other specialist schools, key property and special education staff at the MoE, and project managers and architects designing schools, the collective knowledge will continue to grow and inform future-builds and renovations.

**Limitations of findings and suggestions for further study**

Undertaking this research during a pandemic reduced my ability to visit a range of specialist schools to see examples of design practices and discuss how these impact on teaching and learning. Likewise, my consultation with whānau and stakeholders in the wider community was affected. The focus group participants were fewer than anticipated due to a higher workload associated with COVID-19. The raw data analysed for this research project were small, however I believe the outcomes and findings are valid, robust and useful with a high level of agreement between researchers and professionals. The central case study at Oromahoe, is a unit based in rural Northland and is specific to that context. More case studies over a longer period of time and in a wider variety of regions would serve to further substantiate my findings and recommendations. Many researchers state that the low number of quality empirical studies makes it difficult to substantiate a direct link between buildings and learning outcomes (Barrett et al., 2013; Byers et al., 2018; ERO 2018; Wall 2016a). As further studies are undertaken in New Zealand and overseas, the body of evidence will grow.

**Motivations revisited**

The central reason I wanted to undertake this master’s degree was to broaden my knowledge of how learning areas can be designed and improved so ākonga reach their potential and kaiako are not limited by physical environments. This has been achieved. As Green (2009, p.13) points out “what would be the use of engaging in research as a probe if one already knew what its outcome was?” At the time of writing, uncertainty still prevails with COVID-19, so any thoughts of working overseas are definitely on hold. I want to continue in this field of school property design as it is challenging, creative and rewarding. I enjoy working in a non-teaching role but still within the field of education and remain open to where my career will head from here.
Chapter Six: Outputs and conclusion

In this chapter I introduce my outputs, summarise my findings and revisit the key questions about MoE design guidelines and the additional considerations for students within specialist schools. Prior to starting this research project, I set goals and posed theories, so it is appropriate to end this report by returning in an iterative cycle back to the beginning.

Summary of recommendations when planning and designing learning spaces for students with additional needs (See Appendix O).

This summary of recommendations outlines the most prominent elements to consider in the design and planning process and design features identified repeatedly in research, focus groups, discussions and encountered through my practice of work.

Prompt questions for architects and project managers when planning and designing learning spaces for students with additional needs (See Appendix P).

These questions may help schools and designers or project managers, especially in the initial stages of planning. The list is intended to be organic and to grow as professionals encounter valuable information that was not included in discussions, but could have made a positive impact on the process.

Summary of findings

The best predictor of student outcomes is maintaining student engagement where they interact with other people and the environment (MoH & MoE, 2016; SSAT, 2010; Carpenter et al., 2015). Space is not a thing but a dynamic process (Benade, 2019) where students and teachers co-create and refashion their learning environments to suit specific goals and activities, which can only happen when these areas are flexible and safe. Multiple sources of data show some agreement on what constitutes quality design in theory and practice within the context of a specialist school in New Zealand. Cultural design considerations and consultation serve to ensure schools are fit for purpose for all ākonga (MoE, 2020b).

Implications

The Oromahoe case study and the results of this research project are already informing ongoing new-builds at Blomfield and by sharing these findings with the community of practice we are building a picture of how learning environments can support students with additional needs. The MoE has a working party underway focusing on design for ORS-funded students, so I hope my findings will help to inform and support their work in this area. My learning journey and outcomes have limitations, however my original motivation for starting this project has resulted in greater knowledge and skills that I will apply moving forward in my career. In the long term, my experience designing spaces for people with disabilities or challenging conditions could be expanded to any civic building where consideration is needed for inclusive universal design principles.
Revised professional framework of practice
I returned to my Review of Learning (see Appendix Q) to see how my professional framework of practice has evolved as a result of undertaking this master's degree. My client-centred philosophy focusing on creating an environment where students feel acknowledged, respected and valued is unchanged, however my vehicle for delivering this outcome has shifted from classroom-teaching and career-counselling to creating quality learning environments that are flexible, safe, inclusive and sustainable. My motivation comes from wanting to help young people discover their potential through whakapiri (engagement), whakamarama (enlightenment) and whakamana (empowerment). My knowledge of design in connection to pedagogy and our students has expanded along with my ability to share insights in a confident manner with professionals in my community of practice. Moving to Northland and working with a higher percentage of Māori ākonga, consulting with whānau, and learning more about cultural inclusion within design has challenged and deepened my appreciation and understanding of how the principles of the Treaty of Waitangi (partnership, participation and protection) can be applied in the planning and design process. The objectives I outlined in my cultural consultation document submitted to Kaitohutu (see Appendix C) were forefront throughout this project and I believe I have achieved them.

In the last four years, my involvement with school property maintenance has expanded from supporting a past caretaker with time management, to liaising with trades people for repairs, undertaking monthly building WOF checks and eventually being involved with renovations and new-builds. As a classroom teacher, if anything broke it was "magically" repaired. Knowing how schools operate behind the scenes changed my perspective and I have an appreciation for how time-consuming and expensive processes can be. Walking around school I subconsciously scan for potential hazards and notice physical details that need improvement. I watch how staff and students interact with the environment and get lost in thoughts about how this could be improved, partly because of capturing data for my master's degree but also because I love my job and want to improve life for those around me.

Key questions and theories revisited
The first key question was: How do the national and ministerial guidelines for learning spaces enable effective teaching practice in New Zealand? Through my own experiences as a classroom teacher, careers advisor and transition coordinator at Blomfield, and reflecting on the research undertaken, the simplest answer is if the MoE ensures schools are fit for purpose, the buildings are of a high standard, flexible and safe, then effective teaching and learning is supported. As stated by Hattie (2009) and Osborne (2019) buildings on their own are not enough, it is what kaiako do that counts as change-agents and motivators of learning. Large modern learning environments do not suit all teachers or students and changing the design of existing buildings or moving to a new facility requires time and professional development to learn how to capitalise on new opportunities to teach and learn in different ways.

The second key question is one I have reflected on repeatedly: What are the additional considerations for the design of learning spaces for students in specialist schools and learning-support classrooms? My answer is still evolving because many crucial design features highlighted for learners with additional needs would be good for all students.
Students with additional needs in specialist schools, learning support classrooms and mainstream schools have challenges ranging from mild to severe and not all generate ORS funding that provides additional support. However, in examining what students with very high needs (VHN) require in their learning areas, there is differentiation. Students who struggle with sensory regulation, absconding, challenging behaviour, limited mobility or needing a high level of personal care require additional space not only for themselves but also for the extra staff and equipment. In addition, their environment usually needs low and high sensory zones, secure buildings and playgrounds, more universal bathrooms, wider access, robust building materials and flexibility to manage the very diverse range of needs.

**Goals**

My original goal was to develop guidelines that support stakeholders and professionals around the design process within specialist schools in Aotearoa New Zealand. The MoE produces property guidelines so my focus shifted towards a set of recommendations rather than guidelines to avoid me sounding like an expert, when my experience and knowledge is just starting to expand in this field. Throughout this project I have generated new knowledge specific to the context of a specialist school satellite unit in rural Northland. The challenges and successes of the transition building informed Oromahoe’s design and within an iterative process the lessons we learnt informed how we designed Kamo. My knowledge and skills enable me to facilitate the planning process between school, designers, projects managers and the property and special education teams at the MoE.

In closing, this work-based research project has been very specific to my current role, and it has been practical, challenging and rewarding. The information created is robust, relevant and useful for schools, the MoE and other professionals involved in constructing learning areas for students with additional needs. When shared and added to existing data it adds to conversations and collective knowledge in a specialised domain. The support and input from my mentors, school leaders and the professionals I work with and have met along the way has been invaluable.

*Nā tō rourou, nā taku rourou ka ora ai te īwi.*

With your food basket and my food basket the people will thrive
Reflective Summary- Redacted
References

https://doi.org/10.4102/ajod.v7i0.361


British Broadcasting Commission-BBC (n.d) *Learning English*  
https://www.bbc.co.uk/worldservice/learningenglish/movingwords/shortlist/newton.shtml

Blomfield

https://www.researchgate.net/publication/331260420_Flexible_Learning_Spaces_Inclusive_by_Design

NZCER Press.


Bradbeer, C., Mahat, M., Byers, T., Cleveland, B., Kvan, T., & Imms, W. (2017) The “state of play” concerning New Zealand’s transition to innovative learning environments: Preliminary results from phase one of the ILETC project. *Journal of Educational Leadership, Policy and Practice*. [https://doi.org/021420674982392](https://doi.org/021420674982392)


Carpenter (2019) *Complex needs and children with FASD.*


Department of Education and Training, Victoria (2016) *School provision and planning guidelines for students with disabilities.*


Education Counts (n.d.) *Ongoing Resourcing Scheme.*


Green, B. (2009) *Understanding and researching professional practice*. Sense Publishers


Ministry of Education- MoE (2020b) *The Statement of National Education and Learning Priorities (NELP) and the Tertiary Education Strategy (TES).*


Ministry of Education- MoE (2020c) *Education and Training Act (2020).*


Nel, J (2017) *The role of New Zealand special schools in a climate of inclusion: Supporting learners with significant learning support needs and strengthening the capacity of mainstream settings.* Special Schools Sabbatical Report (pdf)


Wall, G. (2016a) The Impact of physical design on student outcomes: Ministry of Education

Wall, G. (2016b) Maui whakakau, kura whakakau. The impact of physical design on Māori and Pasifika student outcomes: Ministry of Education

Appendices


B. Key design elements for students with additional needs identified by researchers.

C. Māori Consultation with Otago’s office of the Kaitohutohu.

D. Otago Polytechnic ethics application.

E. Oromahoe Satellite Unit- Plans and photographs

F. Oromahoe Satellite Unit- Fencing research and design

G. Blomfield central-campus - Playground resurface design

H. Oromahoe Satellite- Playground research and design

I. Summary of conversations with key stakeholders and professionals in the wider community.

J. Special school and early childhood centre visits- Best practice and lessons learnt.

K. Blomfield Satellite unit at Kamo High School, Whangarei- All rights reserved

L. Cultural consultation with Oromahoe Satellite whānau.

M. Summary of focus group discussions- Positive and challenging design features of the Blomfield transition building. (Redacted)

N. Summary of cultural focus group discussion.

O. Recommendations when planning and designing learning spaces for students with additional needs.

P. Prompt questions for architects and project managers when planning and designing learning spaces for students with additional needs.

Q. Review of learning. (Redacted)

R. Learning agreement. (Redacted)

S. Curriculum Vitae. (Redacted)

T. Feedback from key stakeholders and mentors.
Appendix A
Demand Analysis of the Mid-North Area, Tai Tokerau, November 2017

Demand Analysis

SPECIAL SCHOOL NETWORK

The Mid North Area

TAI TOKERAU

November 2017
The Student Catchment

Figure 1 shows the distribution of year 1 – 8 ORS verified students within the Mid/Far North. Bracketed are the numbers of students attending each school with six students currently travelling to Blomfield School provision in Whangarei daily. In addition there are indications from ministry staff and Blomfield School that there will be further interest from families / whānau seeking special schooling in the Whangarei or Kaitaia facilities for the 2018 school year.

Figure 1: Number of ORS verified students attending school in the Mid North

Table 1: projects the growth of this group of students based on actual students in schooling in 2017 and the anticipated Year 1 numbers of verified children. The number of children in Year 1 has been estimated as an average of the last three years figures.

Nine children in the early childhood sector are known to Early Intervention Teachers in Tai Tokerau. While ORS verification has not been confirmed for these children, the teachers have stated that meeting eligibility is probable. Of this early childhood group 7 children will be of an age to enter school in 2018.

Demand Analysis: ORS Students within the the Mid/Far North Area of Tai Tokerau
November 2017
The Mid/Far North Population Projections

Figure 2 shows the projected population change for Year 1 – 8 students in the Mid/Far North from 2017 – 2027. These projections show overall a stable to declining primary population. A recommendation for a two teaching space satellite unit is likely to provide sufficient additional specialisation for high needs students. The positioning of this satellite unit base would need to be carefully considered to achieve best management of transport in terms of time and distance.

Figure 2:

Far North Projected Population Change for Year 1-8 Students between 2017 to 2027

Property Implications

A satellite teaching space outcome will require a property response either through the refurbishment of existing, available teaching spaces or through a new build programme. The Ministry is currently working with an architectural party on the development of a modular design for a satellite teaching space which could also be a viable option for consideration.

Demand Analysis: ORS Students within the the Mid/Far North Area of Tai Tokerau
November 2017
The Blomfield School network of provision is outlined in Table 2. This includes base school and satellite unit provision, plus services provided to students enrolled in local schools through the outreach teacher service.

Table 2: Blomfield School schooling provision within the Tai Tokerau Region

<table>
<thead>
<tr>
<th>Year 1 – 8 Provision</th>
<th>Outreach Teacher Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Site Whangarei</td>
<td></td>
</tr>
<tr>
<td>Morningside School Whangarei</td>
<td></td>
</tr>
<tr>
<td>Manaia View School Whangarei</td>
<td></td>
</tr>
<tr>
<td>Kaitaia primary Far North</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 9 – 13 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Site Whangarei</td>
</tr>
<tr>
<td>Kamo High School Whangarei</td>
</tr>
<tr>
<td>Kaitaia College Far North</td>
</tr>
</tbody>
</table>
## Appendix B

**Key design elements in physical environments for students with additional needs identified by researchers.**

<table>
<thead>
<tr>
<th>Issues/areas of concern</th>
<th>Key design elements</th>
<th>Researchers</th>
</tr>
</thead>
</table>
| **Safety and Security** | ● All spaces are safe and secure without looking institutional.  
● Do not cocoon students from all external factors that develop their life skills, ability to cope with change and subsequent independence.  
● Limited entry and exits that can be controlled with keypads and fobs. | CABE, 2010  
DFSC, 2014  
McAllister & Maguire, 2012; Riedel & Mahoe, 2019  
Wall, 2016 |
| **Building Layout** | **Space and layout**  
● Equitable, accessible, flexible and meet the complexity and range of needs. Additional teaching spaces resolve conflicting demands.  
● Careful balance of low arousal and stimulating zones.  
● Warm, friendly and provide enough space for independence and fun create a sense of wellbeing.  
● Fit for purpose, hygienic and aesthetically pleasant for both students and staff.  
● Free of obstacles and consideration given to placement of furniture.  
● Space for movement with mobility equipment, additional staff, and for students who need greater personal space.  
**Floors, walls, doors, windows**  
● Blend of flooring with carpet for sound absorption and comfort and lino for wet or messy play that is durable, easy to clean and anti-slip  
● Bright visual displays can sensorily overload ASD students.  
● Displays of learning develop sense of ownership  
● Muted, plain, unpattern colours.  
● Maintenance and cleaning is a constant issue and possibly thought about last by architects.  
**Fixtures and facilities**  
● Design considerations for autism friendly environments relate to sensory aspects: visual-colour, pattern, lighting and glare; auditory- sound insulation, vestibular- rock-ability and tactile with soft furnishings  
● Sinks in every classroom for art, messy play and hygiene  
● Kitchenettes with pull-down roller-doors- safety and flexibility. | Benade, 2019  
Bordas, 2018  
Brooks, 2010  
CABE, 2008  
DFSC, 2014  
Lacey, 2015  
MoE, 2020b  
Osborne, 2016  
Porter, 2018  
Reidel and Mahoe, 2019  
Sunfield, 2006  
Victoria. Department of education and training, Victoria, 2016  
Wall, 2016 |
| **Breakout rooms** | ● Adjacent to the classroom for observation and inclusion. | Benade, 2019 |
| Low stimulation zone for students to withdraw and reset when students feel sensorily overloaded.  
| Quiet space for individual or group activities  
| Enable separate choice and work areas  
| Neutral in colour, free of clutter, windows for supervision but at a higher level to prevent damage, walls lined with Autex for acoustics and safety. |

| Building Research Association of New Zealand Ltd-BRANZ, 2016  
| DFSC, 2014  
| Porter, 2018  
| SSAT, 2015  
| Riedel & Mahoe 2019  
| Wall, 2018 |

| Acoustics  
| Noise distracts from learning and affects communication.  
| Special concern for students with heightened sensitivity or impaired-hearing.  
| Carpet, acoustic panels in ceilings and wall treatments such as Autex absorb sound and reduce reverberations. |

| Benade, 2019  
| BRANZ, 2016  
| MoH & MoE, 2016  
| Reidel & Mahoe 2019  
| Sunfield, 2006  
| SSAT, 2015  
| Wall, 2016 |

| Heating and Ventilation  
| Extreme temperatures make it difficult for students to engage and concentrate and can increase the incidence of challenging behaviour.  
| Students with ASD and limited mobility have difficulty regulating body temperature. Thermostatic control for adjustment by staff is critical.  
| Direct correlation between good or poor internal air quality (IAQ) and people’s health.  
| High windows out of reach of escapees create cross ventilation.  
| Bathrooms require mechanical ventilation beyond standard regulations. |

| BRANZ, 2016  
| Brooks, 2010  
| Maxwell, 2016  
| Sunfield, 2006  
| Wall, 2016 |

| Lighting  
| Light is the most important environmental input after food and water in controlling bodily functions.  
| Provide ample natural-light  
| Ensure lighting is non-flickering with LEDs.  
| Lighting can make or break the ambiance, flexibility and quality of learning areas.  
| Poor lighting leads to discomfort, fatigue and distractibility.  
| Consider careful placement of windows that provide natural-light and views of the outdoors without glare and shadows. |

| Barrett et al., 2013  
| BRANZ, 2016  
| DFSC, 2014  
| Maxwell, 2016  
| Porter, 2018  
| Sunfield, 2006  
| Tanner, 2000  
| Wall, 2016 |

| Furniture and equipment  
| Flexibility and adaptability  
| Can be configured in multiple ways for different activities.  
| Adjustable for correct posture  
| Robust for movement and student actions  
| Chairs that withstand repetitive movements such as rocking. Can be moved by students without tipping. |

| Brooks, 2010  
| Khare & Mullick, 2009  
| Lacey, 2015  
| Osborne, 2016  
<p>| Wall, 2016 |</p>
<table>
<thead>
<tr>
<th><strong>Provide alternative equipment for sensory regulation</strong></th>
<th><strong>gym balls, hammocks, swings, mini tramps, spinning chairs.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wide range of equipment</strong></td>
<td><strong>Interactive whiteboards, computers, communication devices, access technology</strong></td>
</tr>
<tr>
<td><strong>Matt finishes on tables/ learning resources.</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Storage**
- Ample storage. Students with limited mobility come to school with large pieces of equipment.
- Adjoining from classrooms, walk-in and lockable.
- Personal items accessible to students
- ICT equipment is locked away for safety and to reduce distractions.

**Toilets**
- Plenty of space. Sometimes up to five staff assisting students
- Ceiling mounted hoists in Universal Bathrooms
- Near to classrooms
- Low arousal
- Easy to clean

**Outdoor learning spaces**
- Safe, secure, central, children play independently with appropriate sight lines for supervision
- Covered area to shelter from weather
- Positive outdoors spaces create a feeling of harmony with nature.
- Often overlooked considerations in the design process. Just as critical as buildings.
- Unprogrammed spaces allow freedom to imagine and use as they see fit.
- Allow students to let off steam, run and play.
- Provide rich and varied activities not available at home.
- Consider all weather surfaces
- Safe simulation of hazards outdoors encourages independence.

**Funding**
- Projects for special schools require significantly more funding than for other school building projects.
- They require additional support spaces, more robust specialist materials, safety and security systems.
Appendix C

Māori Consultation with Otago’s office of the Kaitohutohu and KTO Feedback

Māori Consultation: Project Overview
My career in education spans over 25 years with a number of roles including teaching, career counselling and most recently, transition and property coordination in a specialist school. Managing school property, overseeing maintenance and becoming a member of the Project Control Group (PCG) for a new satellite unit at Oromahoe Primary School has taken my career in an exciting new direction. Designing classrooms especially for students with complex needs is a collaborative process involving project managers, architects and school representatives with pedagogical knowledge thereby ensuring learning spaces are innovative, inclusive and fit for purpose. Undertaking this Masters in Professional Practice is a transformative process that will enable me to draw on my previous experiences in education and combine these with new-found knowledge of project management and design.

The aim of my research project is to expand my skills as a facilitator and develop guidelines that encompass the varied requirements of students with complex needs in Aotearoa New Zealand. Through an iterative process of action research, I will synthesise data gathered from focus group discussions, visits to schools and consultation with professionals, whānau and stakeholders, and I will reflect on my direct involvement in the design and build of the Oromahoe satellite unit (Oromahoe). This will culminate in a written report, portfolio of evidence, set of guidelines for designing learning spaces for students with complex needs and an oral presentation to a review panel. Feedback, reflection and refinement of findings and outcomes will be ongoing with my academic and professional mentors and the Blomfield Team Leader Māori before being shared with a wider audience. This will ensure all information presented is robust, relevant, useful and culturally responsive.

Māori Consultation: Summary
The Ministry of Education’s strategy, Ka Hikitia, is aimed at changing how the education system performs so all Māori enjoy and achieve education success as Māori (MoE, 2013). Key aspects of this strategy include the Treaty of Waitangi with the principles of partnership, participation and protection; Ako- a two-way learning and teaching approach; productive partnerships; and identity, language and culture. I see my work-based project reflecting these same principles. The processes and outcomes of my research will involve Māori as participants in the focus group discussions and as mentors providing feedback as I undertake my research, as well as stakeholders (whānau, staff and board members) who will be consulted in the Oromahoe design process. The aim of my project is to examine current design practices of schools leading to a set of culturally-responsive guidelines that encompass the varied requirements of students with complex needs.

The Blomfield satellite unit at Oromahoe Primary School is a central focus of this action research project. The majority of the students who will attend this unit are Ngapuhi, so creating a cultural narrative that can be reflected in the physical design of these classrooms will involve consultation with whānau and iwi in the local area. The chairperson on the Oromahoe Primary School Board of Trustees (BOT) has agreed to support me through this narrative process. I will also consult with Blomfield’s Team Leader Māori to ensure I am following the correct protocol when undertaking the focus group discussions and speaking with whānau about their
ideas for the outdoor learning areas as well as when framing and presenting my findings and guidelines in a culturally-appropriate manner. The principles of participation, Ako-, the two-way learning and teaching approach and productive partnerships therefore sit squarely within my project. In seeking data that is robust and relevant I hope to enhance my skills as a facilitator in the design process and produce guidelines that are useful.

Creating physical learning environments that are culturally responsive requires a partnership between professional consultants and school communities who can negotiate local tikanga adaptations within the design. When the culture is acknowledged and valued, students and whānau do not feel like they need to hide their cultural identity to participate or achieve within the school (Wall, 2016b). Cultural visibility involves symbols, patterns, cultural artwork, signs in Te Reo Māori and designs that look to the future from the past. Maintaining the ethos of ‘manaakitanga’, respect, warmth and caring, in the design process is mutually beneficial for all Māori students, staff and whānau as it protects the Māori culture, values, norms, practices and language.

The Māori ethics framework is underpinned by Professor Mason Durie’s visions for Māori education: Māori to live as Māori, actively participate as citizens of the world and enjoy good health and a high standard of living (Otago Polytechnic, 2015). When thinking about how my research contributes to this framework, two of the six priorities can be expressed and incorporated in the following way.

Priority 5: To create an inclusive learning environment that is culturally responsive. Te Ao Māori values are understood, recognised and valued (within the design of the physical learning spaces).

Aims:
- To design learning areas that are a culturally safe place for Māori learners and staff.
- To integrate Māori cultural values into the learning environment.
- To prepare all students for living and working in Māori contexts in their future.

Objectives:
- Ensure cultural practices, values and Māori protocols are followed with the physical layout of the building, e.g., areas for food preparation and eating, ablutions and knowledge acquisition are not mixed.
- Provide opportunities for social interaction, group learning, celebrations and ceremonies by designing learning spaces that are flexible.
- Ensure staff have appropriate training and support to match their pedagogy to a culturally-responsive learning environment and acknowledge the different ways Māori learners may have of engaging with and in knowledge.
- Include Māori imagery and language that reflects the environment, history and culture of the local area within the consultation and design process.
Priority 6: To first engage with, and then ascertain what research priorities are important to the local Māori community (with regard to the design of physical learning spaces).

Aims:
- To undertake research relevant to Māori communities that benefits Māori
- To undertake research that links to Māori development aspirations.

Objectives:
- Consult with Māori stakeholders and mentors throughout my research project and use the feedback provided to inform further iterations.

Reflect on existing research and primary data gathered pertaining to Māori aspirations and cultural considerations within the design process to ensure these are clearly expressed in the guidelines.

**KTO Feedback**

Whāia te pae tawhiti kia tata. Whāia to pae kiā maua. Persue the distant horizons so that they may become your reality.

Office of the Kaitohutohu Māori Research Consultation Feedback

Date: 1 July 2020

Researcher name: Pam Keegan

Department: Capable NZ Master of Professional Practice

Project title: The aim of this research is to create best practice guidelines that align with the legal and MoE property design standards while encompassing additional considerations for students with complex needs. The skills and knowledge gained will enable me to take a facilitative role with specialist schools and external organisations as they undertake the planning and design process.

<table>
<thead>
<tr>
<th>TAIAO: Achieving environmental sustainability through Iwi &amp; Hapū relationships with the whenua &amp; moana</th>
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<tbody>
<tr>
<td>Mātauraka Māori: Exploring Indigenous knowledge</td>
</tr>
<tr>
<td>Hauora: Improving health &amp; wellbeing</td>
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56

Unlocking the innovation potential of Māori knowledge, resources and people.
Name: Kelli Te Maihāroa
Position: Tumuaki: Rakahau Māori | Director: Māori Research, Otago Polytechnic
Category B Ethics Application

Candidate: Pamela Keegan  Application Number: 74

Review Date: 10 July 2020

Application Title: Developing Best Practice Guidelines in Designing Physical Learning Environments for Students with Complex Needs.

Thank you for your application for ethics approval for this project.

The review panel has considered your application including response to questions and issues raised. We are pleased to inform you that we are satisfied with the revisions made and confirm ethical approval for the project.

Many thanks for your careful responses to our recommendations.

All future correspondence regarding this application should include the application number assigned.

We wish you well with your research.

Regards
Appendix E
Oromahoe Satellite- Plans and photographs. All rights reserved
Wairau Valley Special School Modular concept was the original design that our PCG was presented with.

First Concept plans devised with the designer at Avail Pacific based on our required layout.

Major iterations and notes made leading to the final plans:
Proposed site plan submitted to council.
General arrangement and reference plan submitted to council. Mode Architects.
The original site where the old school house was removed to make space for the unit without taking any playground space away from the host school.

Stages of construction
Photos of the unit nearing completion

Front of unit and fencing

Completed unit prior to fencing and deck at entrance

Covered deck to playground and corridor prior to manifestations being applied.
Learning space 2 looking towards the breakout space and the operable wall.

Learning space 1 with some of the muted, flexible furniture.

Manifestations on doors and windows create privacy, reduce distractions and connect with class names: Manuka, Nikau and the Mahoe which is significant for Oromahoe School and grows in our playground.
Window vision laminate means staff can see out but students cannot see in.

Vision strips on the external doors featuring Maori designs connect the building with the Perspex fence panel designs.

Meeting room set up with comfortable furniture for informal meetings with whanau and other visitors.
Appendix F
Oromahoe Satellite- Fencing research and design.

Design challenge: To build a fence that students cannot climb whilst still maintaining a sense of inclusion with Oromahoe School in a culturally appropriate manner. Materials preferred: natural, robust, cost effective and durable.

Additional features: utilise for sensory items, interactive, cultural visibility, personalised. My idea was to somehow replicate the traditional fences seen around Pa sites that feature uneven heights and posts with simple carvings.

(https://www.pinterest.nz/pin/559642691170146194)
To replicate this design, the following ideas could be considered.

https://www.houzz.com/magazine/10-creative-fence-designs-stsetivw-vs~2977420
and (Fencing photographed at Best Start Pipiwai Road, Whangarei)
Natural timber palings can be used but need to be at least 1.8 metres high and splinter free. Curved fence lines add a softer dimension as opposed to a straight fence. The posts in this photograph are cemented into the ground so the look is the same from both sides. *(The curved option was too expensive and would potentially have posts drifting apart)*
The fence around this Early Childhood Centre is a good example of the staggered height. *(The host school wanted the fence double sided- we put the posts closer)*

The fence can be a combination of posts at different heights and panels with Perspex, chalk paint and murals. *(Drawn by Caleb Piggott- Hard Technology Teacher, Blomfield.)*
**Colours**
Sections of the fence could be painted with murals.

![Mural](https://www.resene.co.nz/homeown/use_colr/heritage.htm)
(Mural photographed at Footprints Educare, Kaitaia)
Murals added to sections of the fence can reflect the local region and include flora, fauna, landmarks or depict cultural narratives. This colour range from Resene incorporates the 7 traditional Maori colours. *(We will add a mural at a later date).*

**Perspex:**
(Comrie Park Kindergarten, Northland) [https://enviroschools.org.nz](https://enviroschools.org.nz)
Perspex enables visibility from both sides and can add colour and interest to the fence. It will need to bevelled to avoid ridges that can be used for climbing. *(We added Perspex designs to three panels)*

**Cultural designs to incorporate into the panels**
Korus and tukutuku panel inserts are one way to incorporate traditional designs. Simple and repeated patterns can look effective. *(Koru and stairs were included in our design)*

**Interactive Fencing**
Use blackboard paint for ākonga to draw on. *(We have a black board panel by the sandpit)*
The completed fence at Oromahoe
Appendix G

Blomfield Central Campus: Playground Design and Resurface- All rights reserved

The previous matting at our central-campus was monotone, dull and uninspiring with tiles that were lifting and becoming trip hazards. We identified the Numat Pour and Play option as a chance to transform our playground into something truly unique. It needed to cater for the wide range of ages, abilities, and physical needs, be culturally inclusive, and incorporate the Universal Design Principles being equitable, simple and intuitive to use, flexibility of use, and low physical effort. Some of our ākonga require support in learning "how to play" and our new playground needed to provide this context to help inspire and prompt more opportunities for play.

The design for our new playground was an intensive process. I consulted with staff using their professional knowledge:

- Specialists- sensory and physical needs of students
- Behaviour analysts -social gains
- Teachers and support staff- opportunities for learning and play
- Team Leader Maori- appropriate cultural visibility

I researched a range of existing designs online and shared these concepts with our senior students to gather their preferences and observed how students played in the previous playground. This process enabled me to create a sketch that the Numat designers translated into a final design through a series of iterations based on our feedback. This included two korus symbolising growth and strength, patterns and swirling fine lines and balance balls to increase movement and balance, a mound for free-play, and numbers and shapes to promote learning. There was also a well-used track for trikes and scooters. Colours were carefully selected throughout the playground to further help the sensory needs of many of our ākonga. As a whole the playground was transformed into a stimulating outdoor learning environment that is utilised in a multitude of ways. My observations and those of other staff in the weeks following the new playground installation were that the cautious students avoided the mound and other areas they perceived as risky, many ākonga were more active and engaged, the swings and path were well used while set equipment like the balance balls were not. New surfaces such as "pour-and-play" require more maintenance than old matting, so extra time for a maintenance regime with the caretaker is needed. A sandpit that was centrally located was later removed and placed further away on the field due to students dropping handfuls of sand, which was lifting the surface.
My initial sketch of playground design and final design:

Final Plan for resurfacing the central-campus playground at Blomfield created by Numat in consultation with Blomfield.

Before and after photographs:
Appendix H
Oromahoe Satellite- Playground research and design

This research formed the basis for what was later added to the Oromahoe playground.

Universal Design Principles applied to playgrounds: equitable, simple and intuitive use, flexibility of use, and low physical effort.

These playgrounds have a range of interesting features, some of which can be made by the Blomfield Hard Materials teacher with assistance from senior students.

https://www.childcarehub.co.nz/playscape

**Positive features:** Simple archway, paths, musical instruments, a small whare for a quiet space, natural products to sit and balance on at low heights. **Challenging Features:** Placing a high edge around a sandpit reduces access for some students. Rocks set in concrete are a tripping hazard. A hut or any items near the fence can be used to climb and escape.

https://teamturf.co.nz/thompson-st-playground/

**Positive features identified:** Use of natural timber for bulk of playground, bucket swing, low beams for balance- but design to avoid entrapments. Mounds are an ideal opportunity for free play- can go higher. The shade sail over an in ground sandpit provides protection from the elements. Artificial grass and a small amount of “Pour n Play” also a good idea for durability and colour. **Challenging Features:** Sawdust and bark can be thrown. **Balance and climb**

https://www.playgroundcreations.co.nz/natural-play/

http://www.greenstonedesign.co.nz/school-playgrounds.html

Ropes and climbing frames can be constructed lower to the ground for students of all ages.


This hut created from upcycled pallets is a great climbing frame and has the added feature of creating a place for students to withdraw to.
Outdoor furniture and soft movable play equipment
Cultural and environmental considerations can be included in the design.

Furniture made by [https://childspace.nz/workshop](https://childspace.nz/workshop)

[https://www.resene.co.nz/archspec/products/Mother-Duck-Childcare.htm](https://www.resene.co.nz/archspec/products/Mother-Duck-Childcare.htm)

These items provide colour, comfort, ease of use and flexible play options. (We bought similar items with the Tu Manawa Trust fund.

[https://www.pentagonplay.co.uk/products/imaginative-and-creative/performance-stages](https://www.pentagonplay.co.uk/products/imaginative-and-creative/performance-stages)

Stages in playgrounds can spark imagination and confidence in performing. 
**Imaginary and free play:** Simple benches can be used for balance, as a table, a seat, or for free-play.

[http://www.greenstonedesign.co.nz/school-playgrounds.html](http://www.greenstonedesign.co.nz/school-playgrounds.html)

**Marble/ ball and water run**

[https://creospace.co.nz/gallery/nggallery](https://creospace.co.nz/gallery/nggallery)

[https://www.compassplaygrounds.co.nz/portfolio](https://www.compassplaygrounds.co.nz/portfolio)

**Musical Instruments outside**

[https://www.pinterest.ca/pin/327707310394374202/](https://www.pinterest.ca/pin/327707310394374202/)

A musical wall or music station can be created from upcycled objects such as PVC or metal pipes, bamboo, and old or instruments.

**A sandpit at ground level with some edging for students to sit on provides easy access**

[https://brightstars.co.nz/](https://brightstars.co.nz/)

Sand is a natural element that provides a sensory dimension with its changing consistency when wet or dry and provides hours of free play and creativity.

**Mounds**

[https://teamturf.co.nz/milford-reserve-playground/](https://teamturf.co.nz/milford-reserve-playground/)

Mounds provide the opportunity for ākonga to climb, roll, sit and observe from a height. Synthetic turf means these are hardier and usable in all seasons. Slides, climbing equipment and a water trough can be added. The dirt required to build the mound is readily available during the construction of the classrooms.
Sensory Paths and walls


Paths created with fixed items are an ideal sensory experience. Loose bark and stones can be thrown so would be avoided.

[https://www.pinterest.co.uk/pin/837599230684579346/](https://www.pinterest.co.uk/pin/837599230684579346/)

Movable walls with sensory play items allow these to be stored overnight to avoid damage.

Photograph taken when I visited BestStart Pipiwi Kindy

Native plantings are hardy, non-toxic and can be used for cultural activities.

**Quiet Spaces:**

[https://www.compassplaygrounds.co.nz/portfolio/playground-structures.htm](https://www.compassplaygrounds.co.nz/portfolio/playground-structures.htm)

Building an open sided small whare allows for passive observation by staff and gives students a quiet place to withdraw to.


Maori art work and words in playgrounds serve as a reminder of Blomfield values and need to be in English and Maori.

**Final sandpit and playground visuals shared with the landscapers**

Sandpit: rounded edges with logs of uneven heights and some logs to sit and balance on. [https://www.pinterest.nz/pin/190910471690262957/](https://www.pinterest.nz/pin/190910471690262957/)

Path slightly higher than sandpit. Logs around the edge too.


A few steps through the middle of it (steps and place to sit)
The digger from the Playground Centre. (This will be added at a later date)
[https://www.playgroundcentre.com/products/sand-digger](https://www.playgroundcentre.com/products/sand-digger)

Entrance to the sandpit- use round posts with the simple arch above. Top arch: half rounds/ flat side facing forwards for uniformity. (This will be built in the next year).
[https://www.childcarehub.co.nz/playscape](https://www.childcarehub.co.nz/playscape)
Mud kitchen made by Blomfield staff and ākonga to go on the edge of the playground. We have a hose from a nearby tap running to this.
Ecoshed Garden shed set in the fence line at the rear of the unit for sandpit toys/ bikes etc. Plain on front and painted school colours 3 sides behind the fence. [https://ecosheds.co.nz/gallery/](https://ecosheds.co.nz/gallery/)

Mound similar to central-campus. Prep of our base school mound and finished product.

Quiet space at end by Perspex panels- school to create a “hut” and seating for ākonga.
Swing: Fall zone for rubber matting- 7500 wide x 6280 long

The plan I sketched was utilised well by North Park and we are very happy with the end result.
Photographs of the playground as at December 2021 prior to grass and swing completion. Posts in sandpit are old power poles taken from a farm and will withstand the elements well.

Mounds, pathway and Mahoe tree
We will create a quiet space towards the front part of the playground. The width of the path is narrower than intended. A portion of the width discussed with the builders (900mm) was lost with the construction of fencing.
## Appendix I

Summary of discussions with key stakeholders and professionals in the wider community.

<table>
<thead>
<tr>
<th>Issues/areas of concern</th>
<th>Key design elements</th>
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</table>
| Students and pedagogical practices | ● Design is about how teachers might manage learning environments that create irresistible invitations to engage through repetitions with variety.  
● Springboard off students’ special interests to make other learning meaningful and fun. It is a balance of variety, interest, novelty and change but still structured and predictable.  
● Build connections, build relationships and build play.  
● Multiple resources are needed to expand the students’ play schemes, engage them in learning and encourage movement and communication, but without over stimulation.  
● Students, especially those with ASD need sensory rich environments and a higher level of sensory input. |
| Consultation | ● School staff and management should have the right and ability to respond to the needs of their community within the design process from the outset. They provide real world feedback.  
● Allow staff time, energy, freedom and the opportunity to have their say from the outset for better buy in. Questions to consider: What’s our vision? What would an ideal classroom have and what does that have to do with teaching and learning?  
● Architects need to consult with the special education team and property delivery managers at the MoE and with schools to understand additional design requirements.  
● Ongoing meetings and socialising between special school staff and host school staff helps build unity, inclusion and a collective understanding of the students’ additional needs. Students are accepted and feel part of the whole school rather than an add-on.  
● MoE property staff can change during the design and build process, so it is important for schools to stay strong and remember what they want. |
| Safety and security | ● Security and safety in school buildings and playgrounds is the number one priority to prevent absconding and injury. This includes limited staff controlled exits, secure fencing, lockable floor to ceiling cupboards and high windows. As one principal stated, “It has to have all the security of a jail and the organisation of a hospital and isn’t allowed to look like either.”  
● Not all satellite units require fencing and are open to the host school, however this will vary between schools depending on current and projected student cohorts. If any students are “runners” they would not be able to attend a unit without secure fencing.  
● It is a balance between wanting to be integrated with mainstream schools and looking after the health and safety of the ākonga. |
- Kitchens off classrooms or circulation areas may need to be locked especially for younger students or those whose awareness of danger is minimal.
- Switches for windows and lights higher up or covered.
- Contrasting colours around door frames for visually impaired students.
- The use of glass in specialist schools and units is the biggest concern for the MoE and schools but many architects love glass. Ranch sliders and glass doors with mid-rails reduce costs of replacement when broken. Solid lower sections and glass higher up reduces the likelihood of damage. All glass is laminated and toughened.

<table>
<thead>
<tr>
<th>Building layout</th>
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<tbody>
<tr>
<td><em>Schools need to be future proof and founded on safety, space and universal design.</em> Generic and yet flexible enough to cater for all ākonga based on the evolution formed by pedagogy, learning styles and physical needs, local situation and the history of how the building is best used.</td>
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</table>

- Focus on the students’ experience in the space rather than the adults. Consider heights of benches, fittings and fixtures.
- Consider space and placement of furniture so all ākonga including wheelchair users can manoeuvre easily but also consider those who are hearing or vision impaired or who have ASD.
- Cut out the narrative of "just 6-8 students in a classroom" with architects. It has eight students, plus five staff and visiting specialists, plus all the additional equipment.
- Good square meterage allows greater flexibility within footprints and does not limit ways of thinking that may change over time. Roll growth over the following ten years and non-teaching spaces are added to new builds to achieve higher School Property Guide (SPG) entitlements. A common consensus is a minimum of 70m2 for classrooms. Expanding buildings at a later date is expensive and often not possible due to diminishing green spaces.
- Provide quiet, low-stimulation spaces for self-soothing and larger class spaces for stimulation, movement and activities. Varied ceiling heights, wall and floor treatments and colours help to delineate different zones. The size of spaces can be altered with operable walls and furniture.
- Large open-plan classes similar to ILEs in mainstream schools limit the type of student who can attend, especially those with sensory modular disorders who cannot cope with noise, movement, open spaces and lots of people.
- Some principals believed a cookie cutter approach such as modular designs do not suit all schools or allow for personalisation of designs. However, the build process takes longer for a bespoke build with quality facilities and schools need to be careful not to promise completion dates too quickly with their community.
- Create learning spaces that are home-like for functional life and leisure skill development in preparation for the world beyond. Consider the students’ pathway.
- The challenge is creating high quality robust environments, resources and equipment. Maintaining buildings at a high level makes staff and ākonga feel valued.
- The exterior of satellite units need to blend in with existing host school buildings to maintain consistency and inclusivity with neutral colours internally.
- Include welcoming meeting rooms for whānau and visiting specialists near the main entrance.
- Avoid corridors which are a waste of space and become dumping grounds for equipment. Create central circulation spaces that are large enough to be used as additional learning areas as well.
- Some schools preferred to create breakout spaces using furniture, while other schools wanted these to be built into the classrooms. These differing opinions reflect variations in pedagogical approaches. Opinions about Sensory Rooms also varied but the key advice was flexibility and consultation with schools rather than buying large expensive items that may never get used.
- A unique concept of note in one West Auckland school is being part of a hub with non-teaching spaces that are used by other services that the school works closely with such as Deaf Education NZ, Northern Health School, and the Outreach teachers.
- And finally: You will never get a design 100% right- there will always be features you would do differently the next time.

| Acoustics, ventilation, heating and lighting | Lots of natural-lighting especially from high windows avoids sensory overload and creates filtered light. Big low windows can be easily broken and are distracting especially if there is quite a bit of movement. Glare is difficult for students with cortical vision impairments and those using eye pointing devices. Quality acoustics are critical especially in environments where some students make a lot of noise. Maximise Autex on walls and acoustic ceiling tiles. LED lighting reduces vibrations and flickering. |
| Outdoor learning spaces | Outdoor learning spaces with plenty of equipment for movement and sensory regulation helps students reset. These are sometimes referred to as “get out and jump zones” that are used as part of the learning rotation. Outdoor learning spaces are important but covered in the entitlement of square meterage by the MoE. Satellite units are often boxed into a corner with minimal outdoor space. |
| Furniture and equipment | Sensory and play equipment does not need to be expensive or high tech. |
| Storage and space | Space for storage is critical to cater for students’ sensory, personal and physical needs, higher staffing levels, users of wheelchairs and mobility aids, and for storage of extensive and often bulky equipment and |

80
resources. Larger items such as wheelchairs and hoists can be parked with higher shelving above for light items.
- Cubbyholes allow staff and students easy access to certain equipment, while locked cupboards store resources that are rotated for novelty and dangerous items.

<table>
<thead>
<tr>
<th>Toilets</th>
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<tr>
<td>● Good unisex ablution facilities separated from classrooms that are large enough to cater for students requiring assistance, wheelchair access and those of a large stature.</td>
</tr>
<tr>
<td>● Do not install or use hoists that run from classrooms to toilets to protect the dignity of ākonga.</td>
</tr>
<tr>
<td>● Toilets that can be accessed from the playground to avoid highly stressed students walking through the classroom, or those with soiled clothing or mess from playing outside.</td>
</tr>
</tbody>
</table>
Wairau Valley Satellite Unit: Glenfield Intermediate, Auckland
Teachers used breakout spaces in different ways to suit their students and teaching practices

Using plywood to create robust walls in high user or narrower spaces

Multipurpose circulation space/movable tables/ Technology spaces/ entrance to all classes. Wide enough to be an additional teaching space. But kitchen benches are too small and cluttered to be fit for purpose.
Narrow cupboards built to fill the gaps created due to the modules being built off site and connected on site. Ineffective storage and cluttered central area of building.

Varied learning spaces and flexible layout with furniture.
The unit was built on a steep hill and the deck needed a high fence for safety reasons which created a closed in feeling. Design for security without it looking institutional.

Footprints Educare Centre Kaitaia
Beautiful manifestations on windows create privacy and let in natural light. Art work around the centre reflects the vision and culture of the centre.
Playgrounds and the equipment does not have to be expensive and much of it can be handmade or upcycled. This creates a more natural feel.

**BestStart Pāpiwai Kindy Whangarei**
Plenty of space for varied activities, a whare to withdraw to, paths and native plants combine to create a playground fit for purpose.

Safety with padding on poles, bags hung up, higher fences and space to move. When students see themselves they belong and feel connected.
Kind Hands Respite Care Cottage:
Meeting the students’ sensory needs. Simple equipment in a hall that can be darkened. Multifunctional and cost effective. Tray tables can be filled with different sensory/messy play items each day.

Students need flexible open spaces for play, movement and interaction as well as quiet places to withdraw. The small whare and deck area can even be used for pretend play with dolls, beds, kitchens. Paths lead through to multiple activities and different spaces. Using natural products and Maori designs is calming and culturally responsive.
Creating a home-like comfortable feel with furniture that is the right size for students.

**Auckland Central Specialist School Satellite- Balmoral Intermediate, Auckland**

A central kitchen and dining area for staff and ākonga helps build relationships and teaches students life skills. Glass in doors maintains connection with the rest of the class and staff can passively supervise. Students’ belongings are within their reach for independence.

Robust building material, simple designs and cupboards that lock = safety. A large storage area for bulky equipment was built for future-users in mind.
Appendix K

Blomfield Satellite unit at Kamo High School, Whangarei

Planning started mid 2021 for a new three-classroom unit at Kamo High School. Research undertaken for this project helped to inform a number of decisions regarding layout, especially with the wider multipurpose circulation area, reduced amounts of glass, toilets separated from main areas by smaller corridors, simple ceiling, wall and floor treatments. This unit caters for teenagers and requires a large central kitchen and laundry for life skills. A ceiling hoist to assist with mobility in class activities and a breakout space that is used for sensory activities supports the wheelchair-user students in classroom 3.

The initial sketch was put together by our deputy principal and myself which the architect utilised for the concept plans. We got a little bit stuck with the corner by the laundry and left that to the professionals to tweak. The final plan

The evolving plan is nearing completion at the time of writing as is the landscape designs.
Providing us with three-dimensional plans allowed us to see details not shown on a floor and avoided a number of design issues through a process of feedback from us. The architect wanted these lovely designer ceilings with circles which would have distracted our ākonga. We asked for a plain ceiling and less glass.

Preliminary Design Issue (21 December 2021) from our architects at the Ministry of Architecture + Interiors.
Appendix L

Cultural consultation with Oromahoe satellite whanau, 9 April 2021

Discussions regarding prior to Cultural Consultation with staff at Blomfield

Blomfield Outreach Teacher Mid North:
For me to do my Pepeha it shows I’m making an effort to connect with them. They will appreciate it.
Start with a karakia and my Pepeha
Before start ask them to say who they are
Explain that we are talking about their Tamariki and the future Tamariki
There to hear their ideas
Close with Kai

Blomfield Team Leader Maori:
Invitation: Ask if anyone would like to open up our meeting with a Karakia- if not we do it.
Use the Blomfield Karakia- no need to have words available- that’s not how Maori do it
Do my Pepeha and ask introduce themselves
Show the classroom photos
Use big pictures of the ideas we have for the designs placed on the table - makes it more collaborative- ask them what other ideas and thoughts they have- keep it open
Keep the meeting to just one hour- if too long they may not want to come along- an hour is not too much time to give up.
Close with a karakia. low key.
Mention not just our current ākonga
Consultation is about whangaungatanga-(relationships)- keep this in the centre.
Each situation and discussion is individual- different iwi, different perspectives- get to know the people- keep it open.
Never make assumptions.
Go with an open mind and an open heart.
Do not record the meeting- use a brainstorm sheet instead to collect ideas
Ideas to discuss: Designs on the fence panels- Perspex and mural, decal on windows, playground layout and plants, names of classrooms, anyone in the community who may like to help? Local artists?
Invite them to visit the site and look around
Ask who may like to take part in my Cultural Focus Group for my Masters
Invitation: keep it simple- Panui
Letter sent to all participants following the hui.
15 April 2021
Kia ora koutou
Thank you for taking the time to come along to the hui last Friday to share your ideas with us about possible designs for our Oromahoe kura. On reflection I think it was a lot of information to take in and then discuss in such a short time, but there were some really valuable ideas shared. We would still value hearing any further ideas you have about the following items.

- 3-4 Fence panels with Perspex- simple designs
- A mural on 2 gate panels
- Manifestations (frosting) on glass doors and windows in the classrooms and offices
- Words and sensory items in the playground (e.g. swings, sandpit, mud kitchen…)

The central questions are: What art and language do we bring to the classrooms and outdoor learning environment so that our current and future Tamariki and whanau feel a sense of belonging? How can we make this a stimulating, safe and culturally inclusive kura that reflects the culture of Northland and the values of Blomfield?

Below are the words and concepts that I heard and wrote down. Please let me know if I am correct. Is there anything I missed, or that you want to add to this list?

- Everyone liked the plan for the fence with varying heights and panels with Perspex. The main concern is that the Tamariki are safe. Some are very good climbers and like to walk.
- The history of Ngati Hine and naming/ using specific art from the different iwi in Northland would require major consultation and there is the risk of stepping on people’s toes. Keeping the designs generic is safer and easier. Be careful not to be too specific.
- Include sensory items on the fence- visual below
- Places around Northland- Hokianga, Kaeo, Moerewa, Waitangi- but again could this upset anyone if some locations are not displayed?
- Treaty of Waitangi
- Show the importance of being Maori
- Lots of bright colours
- Pepeha for each student and art showing Maunga, Awa, Waka
- Eels (Tuna) - these are in Moerewa and familiar
- Native plants- Northland is covered in bush
- A branch of the Kauri- Blomfield’s tree on social media and documents
- A branch of the Mahoe- the host school’s tree/ logo
- Totara trees which are all around the kura
- Landmarks- Maunga, awa that students can see near school
- Stars (Mataariki) and the stairway to heaven
- A quiet whare for ākonga to sit in
- A mural with a lake, river, mountains
- No plants in the playground- they will get pulled out

Below are a few of the visuals that were shared at the hui. These are just examples from other places around NZ that I found online. Please share anything you want to see included as well. My role is to listen to what you want and pull everyone’s ideas together.
Moving forward I will follow up with a quick phone call to you all. A couple of options are for us to set up an open discussion on the Towai Seesaw page and to look at meeting again early next term once everyone has had more time to think.
If you have any questions or wish to discuss anything, please feel free to contact me by email or phone/ text me on 027357 2881.
Nāu te rourou, nāku te rourou, ka ora ai te iwi.
With your food basket and my food basket the people will thrive.
Appendix M

Summary of focus group discussions: Positive and challenging design features of the Blomfield transition building. (Redacted)
Appendix N

Cultural focus group discussion
The cultural focus group members discussed a range of topics raised by other focus groups, professionals and researchers that include: the negative impact of glare for learning and using communication devices, balancing free choice with supporting students to undertake challenging activities, providing resources ākonga need to interact, communicate and learn in ways that they can absorb, and the importance of regular breaks in quiet spaces to reset for finite amounts of time. Their valuable insights outlined below expanded my knowledge base to include specific cultural considerations that create inclusive learning areas for all students.

Visibility of written word and art forms
When Teo Māori is present and a part of what they do, children feel the environment belongs to them. By putting Māori names on everything, it is visible for all. The written word for adults and symbols for ākonga, especially those who are non-verbal and non-literate. Staff pick up on language they do not know and can use it, and ākonga communicate more because that is what they see and hear at home. Some students do not use words but their visual abilities and visual awareness is strong, so having Māori art visible is important. One student was observed making whakairo (traditional carvings), with playdough on a small whare (house) in the playground. By creating it himself he was communicating that this is what he wanted to see. Signs on doors help with wayfinding but need to be where they are visible throughout the school day.

Comfort
Marae are traditionally a place of learning where you often see people sitting comfortably around the edge of the room, many with their eyes closed. They are listening in the “spirit”. It is a natural thing because if they are relaxed, they are learning. This philosophy of not having to look at the person speaking all the time is also supported by augmentative and alternative communication. Some students look away when they are concentrating and it does not always mean inattention.

Outdoor environment
The outdoor environment is integral to learning so it is important to have the natural elements of trees, wind, and water. Some schools have areas of bush that children love to play in, or relax if they are feeling stressed. It is about the quality of light, the coolness and different shading. Students can get messy playing outside so providing outdoor taps where ākonga can wash their own feet saves the staff time. Having waiata (songs) playing outside in Te reo Māori with old instruments like Kōauau (traditional flutes) and guitars adds to the calming effect of being outdoors. Hearing and identifying birdsong is another example discussed as a way to connect with nature, providing recordings of sounds that students can listen to by pressing a button.

Building layout
In traditional Māori spaces shoes are left at the door, so having a place for bags and shoes just outside the entrance would be ideal. Expand learning areas by having covered all-weather spaces adjoining classrooms. This is important especially in summer and during shared events like kapa haka where sitting in rows of chairs is not ideal. Have a variety of seating options including woven mats for everyone to sit on. There needs to be separate zoning of bathroom
and food preparation areas. Even from a scientific point of view it makes sense. We know about bacteria coming through the toilet flushing system. The kitchen also provides a separate sink for washing the hands to where food is prepared.

Māori art and culture

Colour is important and historically Māori art featured vibrant colours sourced from nature, along with the inclusion of feathers. Hurupaki School is an example of a school using vibrant colours gifted by their local marae to symbolise stories in the area. The use of red, black and white came from a carving school in Rotorua funded by Āpirana Ngata, a politician who served in government from 1928 to 1934. The idea of carving on flat boards is a later addition born out of modern bush timber milling processes. At Porowini Marae near Blomfield there are carvings relating to different hāpu and iwi in the area. Wallace Hetaraka, was the artist who worked with people to understand what was important in each carving. One participant stated, “He can put anybody's story on to wood. Give him a tree and he'll put your whole life on it”. The group agreed that it is appropriate to have carvings in school playgrounds.

One participant in the group described the process she went through in completing a mural on a wall with students which reiterated the point that you cannot please everyone. “Various people complained about the mural but in the end they went with my initial concept of different wakas. The school is the waka and all the ākonga over the years are going to be paddling in that waka and they're all going to have different designs on their paddles… It is the waka to take all those different little babies of all those different chiefs”. It is important to engage artists and kaumatua (elders) in school projects who can “whakapapa” (converse) with everyone. The importance of kapa haka was also raised, “It would be one of the great strengths of Māoridom and is so disciplined. Give me kapa haka, you give me the future, you give me the Maori battalion. If you've given them kapa haka at a young age, by the time they are older you have got a formidable force”.

Connections

When schools and maraes work together sensitively and appropriately important links are forged that expand the opportunities for students. At Glenbervie Primary where connections are strong, students come out of the school environment and go to the marae for flax weaving, kapa haka, celebrations and cooking. It takes time to form these links and is not something that can be manufactured. It is important to give a koha (gift) to kaumatua and kuia (female elders) when they bless or open buildings. One participant summed it up well, “There’s a joke about the dial-a-kuia or dial-a-kaumatua. You pay 70 bucks an hour for someone to fix your fridge but you get someone coming in to karakia (bless) the opening of your million- dollar hospital wing for a bread roll, a luncheon sausage and cup of tea.” For people with a limited idea of Māoridom, they can muck it up, but if they listen, look, remain open and talk then they can make it work for everyone. Care is needed to work with a range of people who represent the community well. Blomfield serves ākonga from all over Northland so unless the relationships are forged with all hāpu and iwi the connections will not grow.
Appendix O

Recommendations when planning and designing learning spaces for students with additional needs.

These recommendations are the result of a work based research project centring around the planning and design of a specialist school satellite unit in fulfilment of my Masters in Professional Practice at Otago Polytechnic, New Zealand. The students’ needs and design features highlighted are applicable to a wide range of learners in multiple settings. Pamela Keegan

Aim: To create a user-centred inclusive environment that places all students at the heart of the design process.

Planning and design: It started with the needs of students and a Demand Analysis from the Ministry of Education (MoE, 2017). Space for new learning areas is usually limited and needs to meet the needs of students (ākonga). Schools are supported by MoE through all stages. Entitlements, budgets, guidelines and building standards set the parameters. Schools have flexibility to articulate and operationalise their vision, and create enabling learning areas in the context of their local community. Consultation and clear communication is critical throughout the planning and build process. Use the collective expertise and experiences of professionals who know how current and future-users will interact with the physical environment. Providing three-dimensional plans during the design process enables school staff to identify iterations thereby avoiding costly variations post-council approval. Follow a collaborative, multi-agency approach: MoE, schools, architects, project managers, key stakeholders in the wider community. Key words: Inclusive, enabling, space, flexible, safe, quality, future proof.

<table>
<thead>
<tr>
<th>Cater for students’ needs with dignity and respect.</th>
<th>Features in physical learning areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical and emotional well-being:</strong> Sensory dysfunction- hyposensitivity or hypersensitivity/ emotional regulation/anxiety/high level of personal cares/ regular movement breaks and calming sensory activities/ development of fine and gross motor skills/ varied comfort levels</td>
<td>Sensory-aware environment- high and low-stimulation zones/ spaces to socialise or withdraw Breakout rooms and easy access to outdoors to reset Low distractions/ arousal- careful placement of windows. Consider use of manifestations to reduce glare/ quality acoustics/ ceiling mounted LED lights Calm environment- neutral colours/ simple wall and floor treatments/ minimal clutter Outdoor covered areas- play, therapy/ movement, spaces away from others, connection to nature Equipped Universal Bathrooms -staff assistance and/or greater independent movement Hygiene- easy to clean surfaces, flooring, furniture, equipment/ sink in all learning spaces/ well-equipped laundry. Controllability of heating, ventilation, lighting- passive and mechanical</td>
</tr>
<tr>
<td><strong>Autonomy and choice:</strong> personalised learning/ wide variety of activities, equipment and resources</td>
<td>Varied spaces for quiet or busy/ messy activities- mix of flooring treatments Large range of equipment and resources rotated for novelty, challenge and motivation Flexible for kaikako and ākonga to co-create and repurpose environment Quality outdoor learning spaces considered from outset of design process</td>
</tr>
<tr>
<td><strong>Safety:</strong> challenging behaviour/ less understanding of danger or physical limits/ vulnerable/ security balanced with independence</td>
<td>Physical boundaries- secure buildings with exits controlled by staff/ fencing around outdoor learning areas that are culturally/ aesthetically appropriate and non-climbable including awareness of objects by fencing. Robust building material- walls/ doors/ fittings/ furniture. Consider how easily doors can slam or remain in tracks/ cavity sliders work well</td>
</tr>
</tbody>
</table>
| Accessibility, equity, ease of use- Aesthetic quality and functionality: Accessibility present but not obvious | Lockable storage / roller doors for kitchens if needed  
Larger teaching and learning spaces for high staff ratio/ additional non-teaching spaces  
Clear line of sight for passive observation  
Ample personal space around students balanced by avoidance of large open spaces  
Careful use of glass in doors and windows- consider solid walls lower down  
Well-designed drop off zones for taxis | Wide circulation spaces, access ways and paths/ clear wayfinding  
Careful placement of furniture for wheelchair users/ students with limited mobility  
Fittings and benches- varied heights and easy to use / wheelchair friendly  
Bathrooms -evenly distributed with good ventilation off separate hallways to maintain privacy  
Furniture-easy to clean, comfortable, robust, varied sizes or adjustable for students/ staff  
Even, level and accessible- flooring, outdoor surfaces, doorways  
Extensive storage- for wide range of equipment, resources/ easily accessed by staff/ students as needed |
| Sense of belonging, comfort and connection- Culturally responsive where learners see culture, language, world views valued/ relationship based agentic teaching and learning | Home-like context: comfortable furniture and fittings of varied sizes  
Operable walls to create larger areas for events/ varied size of learning areas  
Visibility of cultural language, art, significant regional locations, native flora and fauna  
Embracing Tikanga Maori, Ako, Manaakitanga within the design process |
| Discovering potential- Engagement/ life skill development/ communication supports/ play/ time and guidance to practice and implement new learning | Access to range of information technology for learning, leisure and communication  
Visual cues and information, augmentative/ multimodal communication supports  
Well-equipped range of sensory, physical, therapy, teaching resources  
Facilities for real-world learning: kitchen/ laundry/ garden- large enough for staff and students working together  
Parking for fleet of school vehicles used for accessing wider community |
| Additional Consideration- Sustainable designs: Future proofing/quality learning environments/ efficient | Flexible enough to cater for current and future ākonga and changes in pedagogical practices.  
Time and support for kaiako/ specialists to consider physical environments in planning/ develop spatial competency.  
Robust and durable materials and equipment, fit for purpose, easy maintenance  
Multifunctional spaces, controllable environments, naturalness, sustainable technology solutions  
Large teaching and learning spaces and storage areas/ more non-teaching spaces for high staff ratio/ administration/ specialists/ professionals visiting from wider community / meeting rooms for whanau. |
Appendix P
Prompt questions for architects and project managers when planning and designing learning spaces for students with additional needs.

How many staff do you have including teachers, specialists, support staff, and administrators?
What is your projected roll growth over the next five to ten years?
What are the physical/behavioural/cultural/sensory and educational needs of your current and future users with regards to the physical environment?
What are your key values, philosophies and strategic goals?
How can the physical environment support your pedagogical practices?
What consultation processes do you want to undertake, with whom and why?
What are the key areas of concern regarding safety?
Your entitlement for square metres will be less than you want. What areas are the highest priorities for space and where are you prepared to compromise?
How would define and create flexibility in learning spaces?
Are there existing plans or building designs that you would like to incorporate?
Appendix T

Feedback from stakeholders and mentors

Principal Blomfield Special School:
“As the only Specialist School in Te Tai Tokerau we are fortunate to have been able to learn with and from Pam Keegan as our Property Coordinator, as she has worked through her Masters in Professional Practice. Pam has fully engaged with solving the property issues of our context with care, passion and increasing expertise. She was the pivotal force in establishing our Oromahoe School satellite, from the bare ground to the open, functioning and remarkable learning environment it is today. Pam’s open to learning approach has been of great value to our school as we seek to create and enhance our learning environment to better meet our students' needs. She is well regarded by a range of Ministry of Education staff, community sectors and other Specialist schools in New Zealand, who will no doubt benefit from her expertise shared in her mahi”.

Deputy Principal Blomfield Special School:
“Pam has shown great determination and commitment as she has moved from a nervous learner to a competent experienced leader in the field of Specialist School property design. She has put in many long hours and navigated competing personal and professional commitments to achieve the completion of her thesis without compromising her day to day workload. She has at times underestimated her own capability and it is pleasing to see her begin to own her expertise and grow in confidence as she is able to articulate her knowledge to a range of colleagues and professionals which in the beginning she would have been reluctant to do. She has a wealth of well researched information that she can put to good use at our school as it continues to expand and as an expert to be consulted in the wider educational property space throughout the country”.

Director, Avail Pacific- Project Managers for the Oromahoe Satellite Unit.
“Pam has been of great benefit to the planning and delivery of the Oromahoe Blomfield Satellite project. Her enthusiasm and attention to detail have been crucial, and having Pam as a point of contact for all project decisions has made the process easier for all concerned. We have read her research with interest, and will put to use her learnings in school projects going forward”.

Assistant Principal Blomfield Special School regarding the recommendations for architects and project managers from a specialist at Blomfield.
“This is a loaded document. Every word carries weight and an unpacking that I am sure is supported by all your research”.

Occupational Therapist- MoE
Grateful thanks for the opportunity to read your thesis, I will certainly devote some time to reading this, in full soon. So, the press is on us to collaborate and share knowledge to get things right, especially ‘the stuff’ your thesis will add a robustness to this endeavour. I really liked the reference to Space is not a thing but a dynamic process so true! You are a great inspiration to have dedicated so much care and time to this work for our ākonga/learners with complex learning, difficulties and disabilities.
A big thank you, 😊!

Lead Advisor, Specialist School Networks, MoE
Thank you for sending your thesis through to me. What an inspirational piece of work you have achieved. It will take me some time to read through the complete work and I have begun today – up to Chapter 3. I have found your descriptions of ākonga/learners very clear and well explained. It is important that when we talk to designers/architects/delivery managers etc about the children and young people who will daily learn in the facilities that we design and build that there is a good understanding of complex learning, difficulties and disabilities. I’m looking forward to reading the next sections of your thesis.
I have recorded the quote “What were they thinking when they built that?!” I am reflecting on just how many times I might have said that!