Professional learning in sustainability education and local curriculum design: One school's practice development through critical participatory action research

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I would like to dedicate this thesis to my beloved boys, Samuel, Thomas, and Benji, who have witnessed this journey firsthand – the late nights, the challenges, and the small victories. Your patience, understanding, and belief in me have made this journey possible. May this work serve as a reminder that learning and growth never stop, no matter your age and stage in life. Chase your dreams and passions with courage and believe in the power of perseverance.

Abstract

The thesis investigates how professional learning and development (PLD) can support primary school teachers in Aotearoa New Zealand to embed sustainability education into their teaching practice and local curriculum design. It establishes the growing urgency of sustainability at both local and global levels and highlights the critical role that schools play in preparing students to respond to these challenges. Despite growing recognition of sustainability in education, a persistent gap remains between policy rhetoric and classroom practice, shaped by political and economic agendas that prioritise growth over sustainability.

Grounded in the theory of practice architectures, this single-site case study examines how school-based practice arrangements and teachers' sayings, doings, and relatings enabled or constrained the integration of sustainability education and local curriculum design. A critical participatory action research (CPAR) design documented teachers' evolving understandings of sustainability, their engagement with PLD, and opportunities created to embed sustainability themes into planning and pedagogy. The research was conducted through critical participatory action research (CPAR) cycles across three distinct phases of the research. Phase One examined the local context; Phase Two evaluated the Sustainability Education and Local Curriculum Design (SELCD) PLD; and Phase Three explored how the PLD was embedded into practice.

The findings show that, while sustainability remains an ambiguous concept requiring contextual definition, teachers' practices still shifted across the phases as they integrated sustainability into curriculum planning. New sayings, doings, and relatings emerged, including place-based inquiry units, Indigenous knowledge integration, and peer-supported learning structures. These practices reflected growing teacher agency and reconfigured practice arrangements. The study revealed that PLD for sustainability must engage with cultural-discursive, material-economic, and social-political arrangements to support long-term change. Key elements include holistic models of sustainability, practical frameworks and resources, localised learning opportunities, time for integration, and a whole-school approach that fosters collaboration.

The study offers a context-responsive, bespoke PLD model for sustainability education that is embedded, localised, and transformative. By foregrounding teachers' lifeworlds and recognising the personal and professional dimensions shaping practice, the model has the potential to enrich the developing literature on site-ontological approaches to sustainability education and teacher professional learning.

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Attestation of Authorship

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

Rachelle Jane Hulbert
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Chapter One

Introduction to Sustainability Education: Positioning it within Education in Aotearoa New Zealand

Sustainability education is increasingly recognised as essential for preparing young people for the environmental, social, and economic challenges of the twenty-first century. Within Aotearoa New Zealand, Education for Sustainability (EfS) provides a framework for developing learners' capacity to think critically, act ethically, and contribute to a more just and sustainable world. Despite policy alignment with these aspirations, the embedding of sustainability education in schools remains inconsistent, frequently reliant on individual teacher interest or external programmes, and shaped by shifting political priorities and evolving professional learning agendas. This research investigates how professional learning can support teachers to embed sustainability education within their teaching practice and local curriculum design. It addresses the central question:

How can professional learning support teachers to embed sustainability education in their teaching practice and local curriculum design?

Three sub questions guide this inquiry:

1. What characteristics of sustainability education are evident in the case study school?
2. How might professional learning be arranged to further enable sustainability education teaching practices?
3. How does sustainability education professional learning shape local curriculum design and teaching practice?

The chapter begins by outlining the rationale for the study and the personal and professional motivations that underpin it. It then examines the conceptual complexity of sustainability and situates the research within the global and national contexts of sustainability education, highlighting the particular challenges faced in Aotearoa New Zealand. Following this, it explores the tension between theory and practice in sustainability education, as well as the politics of the field and their impact on professional learning and development for teachers. The chapter concludes by introducing the theoretical and conceptual foundations that inform this research, outlining the critical participatory action research (CPAR) approach and the theory of practice architectures as the key frameworks guiding this study. In doing so, the chapter positions the research within the evolving landscape of sustainability education and establishes the groundwork for the methodological approach detailed in later chapters.

Rationale for the Study

As sustainability becomes an increasingly urgent global priority, encompassing environmental, social, political, economic, and cultural dimensions, schools play a vital role in equipping students with the knowledge, skills, and values needed to navigate and address these interconnected challenges (Ministry of Education [MoE], 2022b; United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2015, 2017, 2020). Within Aotearoa New Zealand, the New Zealand Curriculum (MoE, 2007) provides a foundation for integrating sustainability education across learning areas. However, research suggests that teachers continue to face challenges in translating these aspirations into classroom practice (Bolstad et al., 2015).

Despite a range of well-developed initiatives such as Enviroschools[1] and Para Kore[2], the New Zealand Association for Environmental Education (NZAEE), and online platforms like Tāhūrangi (Aotearoa New Zealand's online curriculum hub), and Science Learning Hub: Pokapū Akoranga Pūtaiao, the impact of these resources on teachers' practice remains unclear, and under-evaluated. While they offer valuable guidance and case studies, there has been limited research into how teachers access, interpret, and implement them, or how professional learning opportunities might strengthen their use. The NZAEE's current evaluation of professional learning and development (PLD) in EfS, expected in late 2025, is a welcome development in addressing this gap.

Teachers' engagement with EfS is further shaped by shifting national priorities for professional learning, which are often influenced by political and policy changes. Government funding cycles and centralised PLD priorities can limit sustained opportunities for teachers to explore EfS in depth. As a result, professional learning related to sustainability is frequently ad hoc, locally driven, or dependent on external providers, rather than embedded within systemic frameworks of teacher learning. Compounding this challenge is evidence that students in Aotearoa New Zealand demonstrate below-average environmental awareness and optimism (Jang-Jones & Webber, 2019). The OECD's Programme for International Student Assessment (PISA) identified Aotearoa New Zealand as one of only ten countries where 15-year-olds scored below average on both environmental awareness and optimism scales Encouragingly, the report found that school was the primary source from which students learnt about environmental issues. Given that schools remain the primary context through which young people learn about environmental issues, the need to strengthen teacher capability and confidence in sustainability education is both timely and necessary.

[1] Enviroschools is a nationwide programme focused on environmental action. Facilitators work with schools empowering young people connect with their environment and lead sustainability projects within their communities (Enviroschools, n.d.).

[2] Para Kore provide programmes, mentoring and resources to support Māori throughout Aotearoa New Zealand through education. They advocate from a Māori worldview of zero carbon and zero waste to support the wellbeing of the natural world.

This research responds to these challenges by investigating how professional learning and development can support teachers to embed sustainability education in their teaching practice and local curriculum design. Specifically, it examines the ways professional learning can enable, constrain, and transform teacher practice within the unique context of a primary school engaged in critical participatory action research (CPAR). Through this focus, the study aims to contribute new insights into how structured professional learning using the theory of practice architectures (TPA) can move sustainability education from the periphery of curriculum rhetoric to a more central and enacted position in teaching and learning.

Researcher Motivation and Positionality

My interest in this research stems from more than two decades of experience as a teacher and teacher educator, during which time I have witnessed the possibilities and challenges of embedding sustainability in classroom practice. When I transitioned from teaching in a mainstream primary school to working in tertiary teacher education in 2013, I was asked to design a third-year course, *Education for a Sustainable Future*, within the Bachelor of Education (Teaching) Primary degree. This opportunity increased my understanding of sustainability education and revealed how curriculum design can influence teachers' capacity to integrate sustainability meaningfully across learning areas.

Through the process of designing and teaching this course, I became more aware that Education for Sustainability (EfS) was not firmly embedded in many primary classrooms in Aotearoa New Zealand. Although a wealth of resources existed, teachers often lacked the professional learning opportunities needed to translate these ideas into effective practice. This recognition prompted my interest in investigating how structured professional learning could strengthen teachers' confidence and capability to design locally responsive sustainability curricula.

My approach to teaching and research is grounded in a values-based pedagogy that emphasises critical thinking, collaboration, and action competence – elements that Jenkins (2015) identifies as foundational to effective teaching and learning in EfS. Meaningful, real-world learning motivates both teachers and students to act with purpose and hope. As Murray (2011) suggests, connection to an issue is a powerful catalyst for action. This belief underpins my commitment to localised curriculum design, ensuring that sustainability education speaks to the lived realities of students and communities. I am guided by the notion of a pedagogy of hope (Brock, 2017; Freire, 1992; Le Grange, 2011) which positions education as a transformative and empowering force. When anchored in practice, hope enables both teachers and learners to envision alternatives and act upon them. Through this pedagogy of hope, I aim to foster student agency by empowering teachers and students to engage critically with sustainability challenges, to believe that a healthy world is possible, and to see themselves as "solutionaries" (Weil, 2016, p. 35), who contribute practical, effective, and meaningful responses to social and ecological challenges.

This research, therefore, reflects both a professional commitment and a personal conviction: that sustainability education can serve as a guiding framework for curriculum design and teacher practice. By examining the role of professional learning in this process, the study demonstrates how sustainability can be embedded through critical participatory action research (CPAR), the theory of practice architectures (TPA) framework, local curriculum development, and sustainability-focused pedagogy and resources in practical, coherent, and contextually responsive ways across school settings.

Having outlined the personal and professional motivations that underpin this study, the following section explains why it is necessary to clarify what is meant by sustainability itself. Before considering how teachers interpret and apply sustainability in practice, it is important to explore what the term means and why its multiple interpretations create both challenges and opportunities for education.

Sustainability is an Ambiguous Concept

Sustainability is an inherently ambiguous and complex concept, making it difficult to define. Jickling (1992) describes this problem as a "conceptual muddle" (p. 6), while Wals and Lenglet (2016) argue it is a contested concept. At its core, sustainability is about maintaining and supporting systems for the future. For instance, the Young People's Trust for the Environment (2018) defines sustainability as "a characteristic of something that lasts forever". UNESCO (2012) adds that sustainability is not a finite outcome but an aspirational long-term goal, emphasising that this perspective should not delay the urgent need for transformative change. Given that some policies under the guise of 'sustainability' actually sustain unsustainable systems, such as making fossil fuels 'greener' rather than transitioning away from them, Wals (2015) affirms that questions about what needs to be sustained, why, and how are not easily answered. Sustainability encompasses diverse and often conflicting aspects, including environmental, social-cultural, and economic dimensions (Taylor et al., 2015; Walshe, 2008).

Kennedy (2015) highlights Jamie P. Cloud's[3] perspective that education for sustainability stands in opposition to "educating for unsustainability", which focuses on fear and disempowerment. Cloud advocates instead for presenting "a hopeful view of a new future: good food, community, living within planetary boundaries, meaningful work, and joy" (Kennedy, 2015, para. 3). Education for Sustainability (EfS) fosters neural connections that help learners see interdependence, for example, understanding that humans exhale CO2, which plants use to create food and release oxygen that sustains life. This interconnectedness reinforces the need for education to foster understanding of living systems and encourage action towards sustainable living.

[3] Jamie P. Cloud is the founder of *The Cloud Institute for Sustainability Education* in New York.

Another key challenge for sustainability education arises from the divergent philosophical perspectives through which individuals view their relationship with the world. Anthropocentrism, biocentrism, ecocentrism, and theocentrism reflect different value systems that shape how people interact with environmental and societal issues (Cocks & Simpson, 2015; Hoffman & Sandelands, 2005). While anthropocentrism prioritises human needs, ecocentrism recognises the intrinsic value of all living things. These differing worldviews influence the cultural values and behaviours that underpin sustainability challenges. Such philosophical orientations not only shape how individuals interpret sustainability but also underpin the evolution of educational frameworks developed to address environmental and social concerns.

The term *sustainability* also encompasses a wide range of related discourses, including Environmental Education (EE). Early frameworks such as the *Belgrade Charter* (UNESCO-UNEP, 1975) and the *Tbilisi declaration* (UNESCO-UNEP, 1978) emphasised the importance of addressing environmental issues in education. Lucas (1972) proposed three approaches to EE: education *about*, *in* and *for* the environment. In Aotearoa New Zealand, the *Guidelines for environmental education in New Zealand schools* (MoE, 1999) built on these principles to support teachers' planning.

Extending these early principles, contemporary sustainability pedagogy highlights the importance of student-led action-oriented learning. Jensen and Schnack (1997) and Morgensen and Schnack (2010) emphasise *action competence* as essential for preparing students to address environmental challenges. Closely associated with Education for Sustainable Development (ESD) and EfS, action competence pedagogy empowers students to participate critically and collaboratively in shaping sustainable futures (Lohmann et al., 2021; Osman et al., 2017; UNESCO, 2017). Orr (2016) argues that action competence is the missing 'how' in sustainability education, linking knowledge to transformative practice.

Sustainable Development (SD) and Education for Sustainable Development (ESD) are closely related but distinct concepts. Although widely used, *sustainable development* remains contestable, often described as an oxymoron because it merges oppositional ideas (Redclift, 2006; Spaiser et al., 2017). Its seminal definition in the *Brundtland report* (United Nations, 1987) positions it as a guiding aspiration for humanity: development that meets present needs without compromising those of future generations. At its heart, sustainability concerns relationships - how people relate to one another and to the planet (Murray, 2011; UNESCO, 2012).

Although the UN has promoted ESD since 1992, critics argue that its practices have not always achieved their transformative intent. Kopnina (2018, 2020) questions whether ESD challenges the status quo or inadvertently reinforces unsustainable systems by aligning economic growth with sustainability goals. Holfelder (2019) similarly notes ESD often assumes a predictable future rather than fostering open-ended, collective agency. Nonetheless, ESD pedagogy aligns with current

research emphasising democratic participation and the importance of equipping learners with the skills and motivation to act for sustainability (Osman et al., 2017; UNESCO, 2017).

The notion of Education for Sustainability (EfS) builds on Environmental Education (EE) by highlighting the interconnectedness of environmental, social, and economic systems. In Aotearoa New Zealand, EfS seeks to promote holistic thinking through cognitive, socio-emotional, and behavioural learning (MoE, 2022b). It moves beyond teacher-centred approaches to student-centred learning and collective action, shifting the focus from awareness to the development of values and competencies that enable meaningful action (Singleton, 2015; UNESCO, 2012).

EfS offers a practical pathway for sustainability education, however its success depends on critically examining how the concept is conceptualised and enacted. Fien (1993a) reminds educators that definitions of sustainability embody diverse, and sometimes conflicting, social and economic assumptions. Recognising and navigating these perspectives is therefore essential if education is to respond effectively to the challenges of an uncertain future. While sustainability remains an ambiguous and contested concept, it is this very ambiguity that highlights its importance. The multiple interpretations of what should be sustained, and for whom, mirror the complex realities that education must prepare learners to navigate. Understanding sustainability not just as a definitional challenge but as a moral and practical imperative reframes its role in education.

The next section, *The Critical Role of Sustainability*, situates these conceptual debates within global and societal contexts. It examines why sustainability has emerged as a defining concern for educational systems around the world and explores how schools can act as catalysts for the transformative change required for a sustainable future.

The Critical Role of Sustainability Education in a Changing World

Humanity faces urgent global sustainability challenges driven by three interconnected key factors: human consumption patterns and the resulting impacts on ecological and social systems (Quinn et al., 2015). These dynamics contribute to poverty, ill-health, and environmental degradation, producing complex issues such as climate change, resource depletion, pollution, biodiversity loss, and ecosystem collapse.

Academics and international organisations increasingly recognise education as a vital means of addressing these issues (Cloud, 2010; Eames et al., 2024; Osman et al., 2017; UNESCO, 2017). Education for sustainability (EfS) engages learners in locally relevant and globally significant issues, helping them to understand interdependence, develop critical thinking, and cultivate a sense of agency and hope for the future (Birdsall, 2025; Sterling, 2010; Wals & Benavot, 2017). Sustainability education extends beyond awareness of environmental problems. It emphasises values, attitudes, and behaviours that enable individuals and communities to act for change (Pacis & VanWynsberghe, 2020; Sterling, 2017; Tilbury, 1995). In this sense, EfS aligns closely with ‘lifeworthy learning’,

learning that matters both now and for the future (Perkins, 2016), and supports what Biesta (2017) describes as “grown-up” engagement with the world (p. 7).

The urgency of sustainability education is reinforced by UNESCO (2017), which highlights the central role of education in cultivating the competencies and dispositions required to navigate complexity and uncertainty. Education systems must, therefore, move beyond content delivery towards fostering critical reflection, ethical decision making, and the capacity to participate meaningfully in social and ecological transformation. Recent curriculum debates in Aotearoa New Zealand echoes these global conversations. The shift towards a ‘knowledge-rich’ curriculum, as advocated by Education Minister Erica Stanford (Johnston, 2024), raises questions about how sustainability education will be positioned in future reforms. While foundational knowledge is essential, a curriculum that also prioritises critical thinking and transformational learning will better prepare students to respond to the realities of a changing world.

Education for sustainability is both transformational and grounded in relational learning, recognising the interdependence of people, place, and planet. Wals and Lenglet (2016) describe it as a form of disruptive education, one that challenges dominant market-driven paradigms and encourages learners to see themselves as contributors to the common good. Similarly, Biesta (2016) reminds educators that the goal is not simply to fill minds but to ‘light a fire’, fostering responsibility and action. In contrast to approaches grounded in Human Capital Theory, which position education primarily as an economic investment (Gillies, 2018), EfS invites a broader view of learning as a collective and moral enterprise. By integrating cognitive, socio-emotional, and behavioural domains, sustainability education reconnects learners with the world around them and nurtures what Cloud (2010) calls sustainability citizenship. It invites students to explore what it means to live well within planetary limits and to participate in shaping more just, equitable, and sustainable futures. The following section introduces the primary international framework for collective action, the United Nations Sustainable Development Goals, and considers how these global commitments inform sustainability education.

International Frameworks: United Nations Sustainable Development Goals (SDGs)

The United Nations (UN) has played a central role in shaping international responses to sustainability challenges through a series of initiatives that emphasise education as the driver of transformative change. Building on decades of environmental agreements, the UN’s Sustainable Development Goals (SDGs) provide a global framework for collective action (UNESCO, 2017). The 17 SDGs and 169 associated targets, adopted in 2015 as part of *Transforming Our World: The 2030 Agenda for Sustainable Development*, extend the earlier *Millennium Development Goals* (MDGs) and the *Decade of Education for Sustainable Development* (2005 – 2014).

The roots of this global agenda stretch back to the 1972 *United Nations Conference on the Human Environment* which raised critical questions about balancing economic development with

environmental protection. This was followed by the 1987 *Brundtland report, Our common future* (United Nations, 1987), which introduced the now familiar definition of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The report's influence carried through to the 1992 *Earth Summit* in Rio de Janeiro and the resulting *Agenda 21,* which further embedded sustainability principles into global policy and educational discourse.

Within education, the SDGs provide a unifying framework through which countries can contextualise sustainability priorities and guide national curricula. SDG4: *Quality Education,* and particularly Target 4.7, explicitly call for education systems to ensure that "all learners develop the knowledge, skills, and values needed to promote sustainable development," including through sustainable lifestyles, human rights, gender equality, global citizenship, and cultural diversity (United Nations, 2015, p.19). Education for Sustainable Development (ESD), as articulated by UNESCO (2017), lies at the heart of this global agenda. It encourages learners to develop the competencies, values, and attitudes required to create sustainable societies. These competencies include systems thinking, critical reflection, collaboration, and the capacity to take informed action. The SDGs therefore position education not only as preparation for participation in existing systems, but as a means of transforming them.

While the SDGs are non-prescriptive and designed to be adaptable across diverse contexts, their integration into national curricula depends on governmental commitment and cross-sector collaboration (Dodds et al., 2017). In Aotearoa New Zealand, the principles of the SDGs align closely with the vision of the *New Zealand Curriculum* (MoE, 2007), which encourages students to be confident, connected, actively involved lifelong learners. The challenge, however, lies in ensuring that these global aspirations are translated into classroom practice through coherent policy, well-supported teacher professional learning, and access to relevant localised resources. As part of this study, SDG-aligned frameworks were used within the context of professional learning to support teachers' planning for sustainability education. These frameworks provided a practical tool for connecting global sustainability goals with local curriculum priorities, reinforcing the idea that schools are key sites for advancing both national and international commitments to sustainable development.

To meaningfully apply these global frameworks, however, the specific sustainability challenges faced within Aotearoa New Zealand must first be acknowledged and understood. Recognising the local environmental, social, and cultural contexts in which schools operate is essential for translating international goals into relevant, action-oriented learning. The following section examines the challenges and considers how they shape the context for sustainability education in Aotearoa New Zealand.

Aotearoa New Zealand's Sustainability Challenges

Aotearoa New Zealand faces significant sustainability challenges, including environmental degradation, social inequalities, and economic pressures. Research by the Ministry for the Environment (MfE, 2024) found that environmental concerns ranked as the fourth most important issue for New Zealanders, after the cost of living, crime, and housing. While New Zealanders demonstrate strong awareness of environmental issues, they are more likely to act when they see immediate benefits, such as saving money by reducing electricity use. Actions with delayed outcomes, like tree planting, tend to attract less participation.

The Department of Conservation highlights the need for a coordinated national framework to address these concerns, noting that sustainability encompasses not only environmental protection but also economic and human wellbeing (Department of Conservation [DoC], 2020; Human Rights Commission, 2019). Public opinion reflects this breadth. A Colmar Brunton poll (2019) reported that adults prioritised the child protection, plastic pollution, and the cost of living, while young people (aged 13 - 17) identified suicide rates, pollution, and online data protection as their major concerns. Climate change continues to emerge as a pressing issue, with at least half of respondents expressing significant worry.

Recent studies suggest a gradual but positive shift in attitudes. The *Kantar better futures report* (2024) shows an increase in *EcoActive* behaviours, with 38 percent of participants identifying as people who both value and act on sustainability issues, a three percent increase from the previous report. Despite this progress, concerns about pollution, waste and climate impacts remain high. Encouragingly, research indicates that intentional, well-designed education can help communities address these challenges more effectively (Carneiro de Cunha et al., 2019; McKeown & Hopkins, 2017). Embedding sustainability education within local curriculum design offers one such pathway by equipping learners with the knowledge, values, and skills needed to take informed action.

Although Aotearoa New Zealand, often celebrated for its 'clean and green' image, the reality is more complex. The Ministry for the Environment and Stats NZ (2024), emphasise that how New Zealanders manage their relationship with the land and resources will determine the country's environmental future. Human activity continues to place strain on ecosystems, with significant social, economic, and environmental consequences. These concerns mirror those identified in *Environmental education for sustainability: Strategy and action plan 2017-2021*, which lists climate change, water quality, biodiversity protection, and waste reduction as national priorities (DoC, 2017). Public opinion aligns with these findings, with New Zealanders rating plastic pollution, water issues, and climate change among their top environmental worries (Colmar Brunton, 2019).

Globally, the urgency of these issues is reinforced by the *United Nations' global assessment report on biodiversity and ecosystem services,* which warns that the window to safeguard biodiversity and ensure a healthy planet is rapidly closing (Carneiro de Cunha et al., 2019). The report attributes

species decline to land conversion, overexploitation, climate change, pollution, and invasive species, while also offering pathways for transformative change that align with the principles of Education for Sustainability (EfS), Education for Sustainable Development (ESD), and sustainability pedagogy (Eames et al., 2006; Osman et al., 2017; UNESCO, 2017).

The findings emerging from this study affirm that embedding sustainability education into curriculum design is essential. By fostering knowledge, values, and skills needed to navigate complex environmental and social issues, EfS can empower students and communities to contribute actively to a more sustainable future.

Current Practice in Aotearoa New Zealand Primary Schools

Having outlined the essential need for sustainability education, this section focuses on what is happening in schools today. It explores how Education for Sustainability (EfS) is being interpreted and enacted within primary school classrooms in Aotearoa New Zealand, the challenges teachers face, and the professional learning opportunities that support their work.

Education for Sustainability (EfS) encourages students to think and act with a future focus on the wellbeing of people and the planet (MoE, 2022b, 2024). Promoted as a future-focused theme, EfS aims to equip students to participate and contribute as global citizens. Researchers argue, however, that modern lifestyles have distanced people from their relationship with the Earth. Compared to previous generations, there is now less emphasis on understanding natural systems and greater focus on economic convenience (Mitchell & Mueller, 2010).

In Aotearoa New Zealand, several factors inhibit teachers from planning and integrating sustainability into their classroom programmes. These include limited teacher knowledge and confidence, restricted access to EfS support and resources, and the varying perceptions of importance (Bolstad et al., 2015). Similar challenges have been identified internationally, suggesting this is a broader issue within sustainability education. Different perspectives on young people's relationship with the environment also influence how sustainability is taught in schools (Bolstad et al., 2015). Chalmers' (2011) research found that teachers viewed EfS as a set of topics or learning goals linked to environmental science. Croft (2017) proposed a more participatory approach, positioning young people as active citizens capable of contributing to the environmental and social issues shaping their future. Bolstad (2020a) offers a contrasting view, framing students primarily as consumers preparing for their future economic roles. While each perspective has merit, such variation can create uncertainty about the long-term goals of EfS and how it should be enacted in classrooms.

Education for Sustainability is present in Aotearoa New Zealand schools, though often in uneven or peripheral ways, and not always in ways that promote transformative learning. Research continues to highlight teachers' limited familiarity with EfS theory and pedagogy, compounded by inconsistent guidance and support from the Ministry of Education. Although Aotearoa New Zealand has a strong history of environmental education (EE) (MoE, 1999), the absence of a coordinated national strategy

makes it difficult for teachers to embed EfS coherently across the curriculum. This thesis builds on this groundwork to explore how professional learning can address these challenges and support teachers in integrating sustainability education more effectively.

The challenges outlined here highlight the need for a more coherent and contextually responsive approach to sustainability education in Aotearoa New Zealand schools. This study responds to that need by investigating how strengthening local curriculum design can enable schools to connect learning with the unique environmental, cultural, and social contexts of their communities. Embedding sustainability within local curriculum design has the potential to equip learners with the knowledge, values, and skills they need to take informed action on issues that are significant to them. The following section examines how localisation of curriculum can provide meaningful opportunities for embedding Education for Sustainability (EfS) and supporting teachers to design learning that is both relevant and transformative.

Localisation of Curriculum

The New Zealand Curriculum (MoE, 2007) grants schools the flexibility to design programmes that reflect their community's identity, values, and aspirations. This approach to curriculum planning, termed 'local curriculum design' enables teachers to respond to the unique environmental, cultural, and social characteristics of their communities. For example, sustainability concepts can be explored through local waterways, biodiversity projects, waste reduction initiatives, or partnerships with mana whenua (Māori, indigenous people). This is particularly important for EfS because students live within local ecosystems, where their environmental and social impact begins.

Focusing on local curriculum design provides an opportunity to embed sustainability education in ways that are authentic, relevant, and grounded in place. Place-based approaches to curriculum planning align with international research showing that sustainability learning is most powerful when it connects to learners' lived experiences and engages them directly with issues affecting their communities, making learning more meaningful and action-oriented (Bagnall, 2016; Gruenewald, 2008; Sobel, 2004; UNESCO, 2017). This perspective also reflects Bolstad et al.'s (2012) vision for future-oriented education, which calls for curriculum design to move away from viewing knowledge as fixed content toward understanding it as dynamic and applied - a way of doing, creating, and using new knowledge to solve problems and address emerging challenges. The curriculum refresh, *Te Mātaiaho – The refreshed New Zealand curriculum* (MoE, 2023), reinforces this approach by emphasising connections between learning, culture, and local contexts.

The Ministry of Education's guidelines for strengthening local curriculum design (MoE, 2019a) provide a national framework to support schools to translate the broad intentions of the *New Zealand curriculum* (MoE, 2007) into localised learning experiences. These guidelines emphasise coherence, collaboration, and responsiveness to local contexts. They encourage teachers to draw on community knowledge, cultural narratives, and place-based opportunities to design meaningful

learning. This policy direction was integral to the design of the professional learning and development (PLD) programme developed for this thesis, which sought to support teachers in integrating Education for Sustainability (EfS) within their local curriculum design processes.

Despite these enabling frameworks, research indicates that not all teachers feel confident designing local curricula (Bolstad et al., 2015; Eames et al., 2010). Limited time, competing priorities, and uncertainty about how to align EfS with curriculum outcomes can constrain integration. In some schools, localisation results in short-term environmental projects rather than sustained integration of sustainability principles across learning areas. Effective localisation of curriculum requires deliberate support through professional learning and community partnerships. McDowall and Whatman (2016) highlight this through three case studies in which students and teachers accessed community and professional expertise as part of their learning. Collaborative opportunities to engage with iwi, local councils, and environmental organisations can strengthen teacher capability and community engagement, ensuring that local curriculum design reflects shared aspirations for a sustainable future (MoE, 2021, 2022a).

For EfS to flourish within local curricula, teachers must be empowered to see themselves as curriculum designers capable of connecting global sustainability goals with local realities. This research builds on that premise, examining how professional learning can support teachers to embed sustainability education within their local contexts in purposeful and enduring ways. Although local curriculum design offers valuable opportunities to integrate sustainability education, findings from this study indicate that translating these intentions into classroom practice is complex, as teachers navigate competing demands, varying levels of confidence, and differing interpretations of EfS. The next section explores these challenges in greater depth, focusing on the tensions that often emerge between the theoretical ideals of EfS and the practical realities of teaching.

EfS Theory and Practice in Tension: The Aotearoa New Zealand Context

A key concern for this research is the ongoing disconnection between EfS theory and classroom practice in sustainability education within Aotearoa New Zealand primary schools. This issue has been highlighted in seminal work by Bolstad et al. (2015) and across a substantive body of Environmental Education (EE) and Education for Sustainability (EfS) literature (Bolstad, 2020a, 2020b; Brignall-Theyer et al., 2009; Eames et al., 2010; Parliamentary Commissioner for the Environment, 2005). Studies suggest that EfS is not firmly embedded in curriculum decision-making and remains poorly understood, even though it is an increasingly important concept in schooling.

Since 2015, research related to sustainability education in Aotearoa New Zealand has expanded this knowledge base (Bevins, 2020; Hobson, 2020; Mostafa, 2020). During this time, new resources have also been developed to support climate change education and inquiry-based, placed-based, and participatory learning through Tāhūrangi. However, there is still no formal provision of professional development specifically for sustainability education. Moreover, it remains unclear

whether the growing range of published resources aligns effectively with *the New Zealand Curriculum* and local teaching contexts.

Despite this increased availability of materials, the limited number of Aotearoa New Zealand-specific exemplars highlights the need for further research through detailed case studies. Recent studies have not sufficiently explored the relationship between sustainability education and teacher professional learning, nor examined how these resources are being interpreted and applied in classrooms. Addressing these gaps is essential for understanding how EfS can move from theory into sustained practice. This ongoing disconnection between EfS theory and practice points to a systemic issue: the way professional learning and development is prioritised and resourced in Aotearoa New Zealand. While teachers express growing interest in sustainability education, national PLD priorities have shifted repeatedly in response to political change. The following section examines how these shifting priorities influence schools' capacity to sustain EfS initiatives and the implications for embedding sustainability more fully in curriculum practice.

The Politics of Sustainability Education in Aotearoa New Zealand

Education, at its heart, is political in nature, as Freire (1972) reminds us: it either reinforces existing power structures or challenges them to create a more just society. In Aotearoa New Zealand, political influence has repeatedly shaped educational priorities, with economic agendas often taking precedence. This system continues to reflect 19th - 20th century models of schooling shaped by industrial-era metaphors of efficiency and productivity (Gilbert, 2005; Hipkins et al., 2022).

How education is positioned within the political sphere significantly determines its priorities (Dixon, 2025). Both Dixon (2025) and Hood (2023) argue that the curriculum often functions as a political tool, subject to changing governmental ideologies. For instance, recent policy debates include proposals to mandate government-approved methods for teaching literacy and numeracy (Rawhiti-Connell, 2023). In this shifting policy landscape, schools are required to navigate ongoing change. Government agendas have frequently emphasised measurable academic outcomes and workforce readiness over broader educational aims such as sustainability and democratic citizenship. This emphasis is evident in the Ministry of Education's, *Strategic intentions 2025-2029* (MoE, 2024), which identifies educational progress and achievement as a primary focus. In contrast, Kemmis et al. (2025) argue that education's transformative potential lies in its capacity to enrich both individual and collective life. When students and teachers engage critically with social and environmental issues, learning becomes more relevant (Hill et al., 2020). Such approaches often clash with policy agendas that privilege short-term performance metrics and economic growth.

These tensions have long characterised the history of sustainability education and policy in Aotearoa New Zealand. International environmental commitments have often been overshadowed by domestic economic priorities. Although schools have responded to global milestones such as the *Belgrade charter* (UNESCO-UNEP, 1975) and the *Tbilisi declaration* (UNESCO-UNEP, 1978),

political and policy contexts have frequently constrained their implementation. In the 1990s, reforms under the National government prioritised preparing learners for participation in a competitive global economy, resulting in a subject-centred curriculum, that left little room for environmental education. Despite signing *Agenda 21* at the 1992 *Earth Summit*, Aotearoa New Zealand's report to Rio, *Forging the links* (Ministry for the Environment [MfE], 1992), emphasised market-based solutions and resource privatisation which were positions that conflicted with the collective intent of *Agenda 21*. Consequently, environmental education remained peripheral in the 1993 curriculum (Chapman, 2011; Chapman et al., 2006; Eames et al., 2004).

Later initiatives, including *Environment 2010 strategy* (MfE, 1995) and the *Guidelines for environmental education in New Zealand Schools* (MoE, 1999) introduced key concepts such as interdependence, biodiversity, and personal responsibility. However, the guidelines were optional, and many teachers were unaware of them (Bolstad et al., 2008). Limited professional development and competing curriculum priorities further constrained their impact. A 2002 Ministry of Education curriculum stocktake identified Education for Sustainability (EfS) as a key theme for inclusion in a new curriculum framework, but this recommendation was not reflected in the *Educational priorities* (MoE, 2003). Despite then-Prime Minister Helen Clark's public recognition of Aotearoa New Zealand's lag in sustainability practice, educational policy remained dominated by neoliberal ideals of competition and accountability (Chapman et al., 2006).

The *Sustainable development for New Zealand programme of action* (Department of Prime Minister and Cabinet, 2003) marked an important rhetoric shift by positioning sustainability as central to government policy, influencing the language later adopted in the 2007 curriculum introduced a future-focused vision centred on confident, connected, and actively involved learners. However, sustainability was embedded primarily through values and key competencies rather than as explicit learning outcomes, leaving it marginal to assessment and accountability structures.

Subsequent policy documents, including the *Four-year plan 2016-2020,* (MoE, 2016), reasserted education's role in supporting economic productivity, framing learning as an *investment* in human capital. More recent statements, such as the *Statement of national education and learning priorities* (NELP, 2020) and *Strategic intentions 2025-2029* (MoE, 2024), suggest a partial broadening of focus to include wellbeing, diversity, and inclusion but they provide limited explicit guidance for sustainability education. Chapman et. al (2006) argue that short-term electoral cycles and neoliberal assumptions have made it difficult for successive governments to prioritise long-term wellbeing or environmental stewardship. Economic growth and individual responsibility continue to dominate policy discourse, sidelining collective strategies such as sustainability education.

Despite these challenges, Education for Sustainability persists in Aotearoa New Zealand schools - though often in fragmented ways. It is commonly advanced by passionate teachers or through external organisations such as Enviroschools, Zero Waste, and regional council initiatives (Bolstad

et al., 2015; Eames et al., 2010). Without coherent national policy, however, sustained PLD, or curriculum integration, EfS remains vulnerable to political and funding shifts.

The *Environmental education for sustainability strategy and action plan 2017-2021* (DoC, 2017) sought to address these gaps by promoting coordination across government agencies and identifying three priority areas: strengthen pathways in sustainable practice, building capacity for EfS delivery, and improving collaboration. Although valuable, the strategy remains little known among teachers and has limited formal integration into curriculum planning. Researchers consistently emphasis the need for a whole-of-government approach and cross-party consensus to embed sustainability education meaningfully (Bolstad et al., 2015; Carneiro de Cunha et al., 2019; Martin, 2014). The *Tomorrow's schools independent task force report* (2018), echoes these calls, noting that while Aotearoa New Zealand has a *world-leading* curriculum, the education system is not equipped to meet the challenges of the next 30 years.

Achieving sustainable education reform requires aligning national priorities with global sustainability goals and ensuring that teachers are supported through high quality professional learning, interdisciplinary curriculum guidance, and access to relevant teaching resources (Bolstad & Durie, 2024). Without these systemic supports, sustainability education risks remaining peripheral, aspirational in rhetoric but inconsistent in practice. Having outlined the political and policy influences that have shaped sustainability education in Aotearoa New Zealand, the next section examines how changes in government priorities directly affect professional learning and development for teachers.

Change of Government and Change in Education Priorities: Shifting Sands

Over the past two decades, professional learning and development (PLD) in Aotearoa New Zealand has evolved in response to successive government reforms and shifting educational priorities. Each administration has introduced new emphasis shaped by its and economic agendas. While these changes have sought to improve outcomes for learners, they have created inconsistency in the focus and availability of professional learning for teachers. In this study, PLD is understood in line with McChesney (2017) and McChesney et al. (2024) as encompassing any professional experience, whether formal or informal, structured or incidental, that leads to or is designed to foster teacher learning. Historically, PLD funding and priorities have been centrally determined, with schools required to align their applications to government-identified focus areas. As a result, opportunities for teachers to engage in sustainability education have been largely dependent on whether EfS has been included in national priorities at any given time. This centralised approach has provided some coherence but has also limited flexibility in schools wishing to pursue context-specific or locally driven initiatives.

The resetting of PLD priorities in 2020 by the MoE provided an opportunity to integrate sustainability education more effectively into curriculum design through the focus on local curriculum. The three

priorities for English-medium settings were redesigned to emphasise cultural capability, local curriculum design, and assessment for learning. Strengthening local curriculum design was positioned to focus on “critical teacher capabilities and learning across the curriculum” (MoE, 2019c, p. 1), creating scope for sustainability education to be woven into local curriculum frameworks. The PLD undertaken and delivered during this research aligns with these priorities.

During this research, a change of government led to a shift in PLD priorities, further impacting opportunities for teacher professional development for sustainability education and local curriculum design. The Ministry of Education’s PLD priorities, outlined by Minister of Education Erica Stanford (Stanford, 2024a, para. 5), redirected professional learning towards core curriculum areas, with literacy and mathematics grounded in the science of learning as the primary focus. While the core curriculum is foundational to learning, the absence of explicit reference to sustainability education, and removal of local curriculum design from the PLD priorities, further marginalised EfS within professional learning and development spaces. These changes also created a lack of continuity for schools and teachers, as funding to previously established networks and programmes was reduced or withdrawn, eroding institutional knowledge and momentum. Such disruptions have made it difficult for schools to sustain long-term engagement with PLD initiatives.

The reorientation of government priorities has narrowed the formal avenues available for professional development in sustainability education. Despite these challenges, there are examples of effective regionally led PLD where local knowledge and partnerships have been prioritised. Some schools have collaborated with regional councils, Enviroschools facilitators, and iwi to develop sustainability-focused professional learning. Without sustained systemic support, teachers increasingly rely on informal and alternative learning networks (Mostafa, 2020). Many seek opportunities through external providers, local networks, or self-directed professional learning. However, these examples remain isolated rather than systematically supported, resulting in uneven access and variable quality of professional learning across the country.

One emerging space for this informal professional learning is social media. The Australian Institute for Teaching and School Leadership (AITSL) cautions that while social networks encourage connection, discussion, and resource sharing, and can enrich teachers’ knowledge and skills, they should not replace face-to-face collaboration with colleagues. Nevertheless, AITSL recognises social media as a “valuable additional option” (AITSL, 2020, para. 2). Strengthening national coordination and ensuring that EfS is embedded within both local curriculum and PLD priorities would help build teacher capability and provide greater access to sustainability-focused professional learning.

Sustainability Education and Professional Learning and Development

Embedding sustainability education meaningfully within local curriculum design requires robust professional learning and development (PLD). This is particularly important because EfS calls for

specific pedagogical approaches and interdisciplinary thinking that extend beyond traditional subject boundaries. However, there is a lack of formal support for professional learning in sustainability education (Mostafa & Eames, 2025). Effective change in teaching practice depends on teachers engaging in learning that challenges their existing theories, values, and beliefs about teaching and learning (Avalos, 2011). Therefore, structured and coherent PLD is needed.

Recent findings from the Education Review Office (ERO) highlight that, while schools undertake a wide range of PLD initiatives, there remains a consistent lack of evaluative follow-through and monitoring of their long-term impact (ERO, 2005). This concern in not new, ERO's 2009 report also identified the evaluation of PLD effectiveness as a critical area for improvement. Across both reviews, evidence suggests that too little attention is paid to tracking changes in teacher practice and student outcomes, and that the embedding of new learning is often not well-supported by school leaders. Many teachers reported limited or no improvement in their practice following engagement in PLD, indicating a need for more coherent, impact-focused approaches.

To address these challenges, PLD must include deliberate strategies for assessing how new learning influences classroom practice and student outcomes over time. This study adopts critical participatory action research (CPAR) as one means of achieving this. The CPAR approach as outlined by Kemmis et al. (2014a), enables evidence to be collected collaboratively and cyclically, allowing teachers and facilitators to co-construct, evaluate, and refine each stage of the PLD process. In doing so, it supports professional learning that is reflective, responsive, and grounded in the authentic context of teachers' work.

A recent scoping review of professional learning and development (PLD) by McChesney et al. (2024) identified a need for research that critically and empirically examines the impacts, benefits, and consequences of PLD provision at the system level. While this thesis acknowledges the influence of wider policy and systemic architectures shaping PLD, its primary focus is on the practice architectures within the case study school - namely, the cultural-discursive, material-economic, and social-political arrangements that shape, enable, or constrain professional learning for sustainability and local curriculum design (Kemmis & Mutton, 2012; Kemmis et al., 2014b; Mahon et al., 2017). These dimensions are discussed in greater detail in later chapters, but here they provide a lens for examining how school-level professional learning can be strengthened to support more coherent and contextually responsive approaches to Education for Sustainability (EfS).

Chapter Summary

This chapter has explored sustainability as an urgent global priority encompassing environmental, social, political, economic, and cultural dimensions. Education plays a critical role in shaping learners' values, thinking, and actions within this interconnected world (MoE, 2022b; Osman et al., 2017; The Organisation for Economic Co-operation and Development [OECD], 2021; United Nations

Educational, Scientific and Cultural Organisation [UNESCO], 2015, 2017, 2020). Shifts in behaviour and habits, as advocated by Pacis and VanWynsberghe (2020), are essential if societies are to flourish. These changes that can be fostered through sustainability education, which can be fostered through Perkins' (2016) concept of *lifeworthy* learning.

Sustainability, however, remains conceptually ambiguous (Jickling, 1992) and often peripheral within curricula. In Aotearoa New Zealand, tensions between policy and practice, together with shifting political priorities, have complicated efforts to embed sustainability across the curriculum. Although initiatives, such as Enviroschools, Pare Kore, and the NZAEE provide valuable resources, their impact on classroom practice remains uneven and unevaluated. Frequent changes to professional learning and development (PLD) priorities have further constrained opportunities for teacher learning, leading many educators to rely on informal and online networks.

Framed within these challenges, this research investigates how professional learning can support teachers to integrate sustainability principles and pedagogy within local curriculum design. Using critical participatory action research (CPAR), the study examines how collaborative and cyclical professional learning processes can strengthen teacher capability in Education for Sustainability (EfS). It also considers the practice architectures - the cultural-discursive, material-economic, and social-political arrangements - that shape how teachers engage with sustainability education in their professional contexts. In doing so, the study contributes an evidence-based understanding of effective PLD for EfS, and aims to inform more coherent, contextually responsive, and enduring approaches to sustainability education in Aotearoa New Zealand schools.

The next chapter outlines the theoretical and conceptual foundations of this study, exploring the dominant ideologies that shape education and potential responses to the challenges they present.

Chapter Two

Influences and Perspectives on Sustainability Education: Critical Analysis and Response

Literature Review

The aim of this literature review is to investigate how historical and political ideologies have shaped sustainability education and to consider how educators might respond to the challenges these ideologies present. Drawing on a range of educational and environmental theories, this chapter adopts a critical perspective that foregrounds the tensions between sustainability, education policy, and classroom realities. Analysing sustainability education requires attention to its historical, social, political, economic, and cultural contexts. Accordingly, the first part of this chapter explores historical and political ideological influences, such as capitalism, neoliberalism, economic models for sustainability education, global policy discourse, and Mātauranga Māori pedagogy, that have shaped sustainability education in the Aotearoa New Zealand primary school context.

In the second part of the chapter, possible responses to these ideologies are examined, including Marxist critical theory, education for social change, the importance of a pedagogy of hope, and teacher professional learning and development for sustainability education. In understanding how the past has shaped the present, it is hoped that a more responsive vision of sustainability education might emerge, one that better equips individuals to address contemporary sustainability issues, alongside what O'Neill (2015) describes as the practical challenges arising from society's structural and cultural forms.

Part One

Historical and Political Ideologies Shaping Sustainability Education

This section argues that capitalism and neoliberalism have redefined education in Aotearoa New Zealand as an economic enterprise, favouring market logics over urgent ecological and social challenges. Understanding this ideological framing explains why sustainability education struggles to be embedded in schools.

Capitalism and the Marketisation of Education: Implications for Sustainability

Capitalism has come to define the purpose of modern education, positioning schools as mechanisms for economic productivity and competition. As the prevailing socio-economic ideology, capitalism shapes the markets as well as the cultural and institutional structures of education, evident in Aotearoa New Zealand's 'edu-capitalism' policies (Smith et al., 2016; Ward, 2022). The core pillars of capitalism: private ownership, market competition, and freedom of choice in production and consumption, have not only shaped economic systems but also the purposes and practices of schooling (Klees, 2020). In this capitalist framework, education aligns with market priorities,

emphasising employability, productivity, and competitiveness (see *The Politics of Sustainability in Aotearoa New Zealand* in Chapter One). While these outcomes can generate social and economic benefits, such as workforce participation, innovation, and individual prosperity, their prioritisation often comes at the expense of collective wellbeing and ecological integrity (Lehtonen et al., 2019). This economic rationality also informs how individuals perceive themselves and their relationship with the environment, privileging growth and consumption over interdependence and care.

Examining how capitalism influences education reveals how sustainability education is shaped, and often constrained, by the social structures that prioritise economic growth over ecological integrity. These economic logics also shape how humans perceive and position themselves in relation to both the environment and each other, reinforcing anthropocentric assumptions that place humans at the centre of, and superior to, the natural world (Berryman & Sauvé, 2016; Mulligan, 2018; Orr, 2016; Stirling, 2017). Within education, this worldview legitimises utilitarian relationships with nature and sustains economic paradigms that favour production and consumption over ecological responsibility.

This worldview is evident in consumerism, unchecked consumption patterns, and the exploitation of natural resources, practices that have altered the conditions of life for other species (Jickling & Stirling, 2017; Mulligan, 2018; Parr, 2009; Wals, 2015). Cloud (2009, 2010) and Mulligan (2018) caution that the planet's carrying capacity is increasingly at risk due to resource extraction justified in the name of innovation and entrepreneurship. This mindset exemplifies what Hessen (2018) calls *economic individualism*, a logic that situates human advancement and competition as inherently desirable, even when they undermine collective and ecological wellbeing (Henderson, n.d.; Hessen, 2018).

The modern view of the world informing capitalism has also been shaped by scientific and colonial histories, that imposed Western ideologies over Indigenous relationships with nature (Bang, 2024; Carrara & Chakraborty, 2024). Enlightenment rationalism privileged human reason and control, reinforcing mechanistic assumptions about ecosystems as systems to be managed and exploited for economic gain (Berryman & Suavé, 2016; Orr, 2016). This perspective normalised the commodification of land and life, fuelling industrialisation and expansion that advanced wealth accumulation while deepening ecological degradation (Juniper, 2014; Matthews, 2011). As Mitchell and Mueller (2010) observe, modern societies have become increasingly ecologically illiterate, unable to "read the many interwoven relationships that are comprised of Earth" (p. 195). Hawken (1993) warned that corporate practices threaten to destroy the very ecosystems and cultures that sustain life, noting that, "the land, water, air and sea have been functionally transformed into repositories for waste" (p. 3).

The metaphor of the *invisible hand* (Harvey, 2019; Smith, 1776) continues to influence capitalist logic, suggesting that individual self-interest naturally produces social good. While this idea has encouraged prosperity and innovation, it legitimises overconsumption and environmental

degradation (Kopnina, 2011; Madrick, 2016). Even ‘green’ consumption often reproduces waste and conformity to consumer norms, and can be seen in practices such as online shopping, increased resource use, packaging, waste, carbon emissions, and a culture of disposability (Gray Group International, 2024). Education, however, can counter these logics by cultivating critical awareness of consumption patterns and their ecological consequences (Osman et al., 2017; UNESCO, 2017).

Within the capitalist framework, education has been reframed as a market solution to economic and social challenges. Schools are positioned to develop human capital rather than ecological consciousness, prioritising workforce readiness and competitiveness over critical engagement with sustainability (Klees, 2020). In Aotearoa New Zealand, the *Tomorrow’s Schools* reforms (The Taskforce to Review Education Administration, 1988) exemplified this shift by decentralising governance and implementing managerial models that aligned education with business principles and emphasised accountability, choice and performance. Such policies risk furthering inequality by attributing success to individual merit while disregarding systemic and environmental constraints.

Capitalism’s ideological foundations continue to shape education systems globally, promoting schools as engines of growth and competition over and above being agents of social and ecological transformation. In recent decades, these ideals have evolved and intensified through neoliberalism, which extends market logic further into educational values, governance, and identity formation.

The Purpose of School and Neoliberal Reform

Neoliberal reform has redefined the purpose of schooling, reframing education as an investment in economic growth over and above a process of human and societal development. Within this paradigm, schools are primarily positioned as producers of human capital, sites for cultivating the knowledge and skills required to serve the labour market and sustain economic competitiveness (Bell, 2003; Hayward, 2012; Klees, 2020; Wals, 2015). As Wals (2015) argues, schools are increasingly “seen as the manufacturers of ‘human capital’ needed to serve the economy and as places where the seeds of consumerism can be planted at an early age” (p. 15). The focus on productivity and employability positions education as a private good that enhances individual market value rather than a collective endeavour aimed at the public good (Goldspink, 2007; Martin, 2014; Savage, 2017).

In contrast, critical educators argue that schooling should cultivate dispositions and capacities for navigating the complexities of an uncertain and interdependent world (Biesta, 2017; Tilbury & Wortman, 2004; Wals & Lenglet, 2016; Weil, 2016). This broader conception challenges neoliberal instrumentation by foregrounding the ethical, ecological, and democratic dimensions of learning. Reclaiming this purpose is essential if education is to foster transformative sustainability rather than reproduce the logic of economic growth.

In Aotearoa New Zealand, neoliberal reform often takes a pragmatic, *Third Way* form, an attempt to balance market efficiency with limited social justice interventions (Codd, 2001; Connew, 2006). While

this approach maintains the centrality of market solutions, it offers selective government support for issues such as housing or education (Boraman, 2017). Policy initiatives, such as the government's 2024 $30 million investment in approved mathematics textbooks, reflect this logic of targeted intervention: technocratic fixes designed to improve measurable outcomes (Nicol-Williams, 2025; Stanford, 2024b). Van den Ham and Heinze (2018) argue, resources alone rarely transform learning without sustained professional development and pedagogical change. These initiatives exemplify how neoliberal governance privileges performance metrics and accountability over relational and contextual learning.

In contrast, Weil (2016) reframes the purpose of schooling as "educating a generation of solutionaries" (p. 9) - learners capable of responding compassionately and critically to global challenges. Education, should cultivate relevance, meaning, and moral imagination by equipping students to engage with real-world issues such as environmental degradation, inequality, and social injustice (Booth-Sweeney, 2017; Cloud, 2009; Weil, 2016). Prioritising critical, creative, and systems thinking can transform education from a site of economic reproduction to one of ethical and ecological regeneration. This vision challenges neoliberal pragmatism by reasserting education's democratic and ecological purposes over its economic function.

Within neoliberal contexts, the purpose of education has been narrowed to measurable performance and economic productivity, often sidelining the moral, ecological, and democratic dimensions of learning. Biesta (2017) argues that education's task is to make, "the grown-up existence of another human being in and with the world possible" (p. 7), inviting educators to cultivate learners who can live relationally rather than occupy the centre of the world. This idea of the student subject acknowledges alterity and integrity, that is the capacity to coexist with difference and respect the autonomy of others. These qualities counter the *anthropocentric* orientation of neoliberal culture.

Similarly, Wals (2015) envisions education as the cultivation of agency and competence for addressing the sustainability challenges. Drawing on Apple (2010, 2013), Biesta (2016), and Nussbaum (2010), Wals calls for education that co-creates "more equitable, democratic, responsible, and meaningful ways of living" (2015, p. 6.). Both perspectives share the argument that education must move beyond the industrial-era model that treats knowledge as an economic asset and instead nurture critical, creative, and ethical engagement with the world (Robinson, 2010). Both argue that must move beyond the industrial-era model that treats knowledge as an economic asset and instead nurture critical, creative, and ethical engagement with the world (Robinson, 2010).

Despite these transformative visions, neoliberal reform continues to dominate educational policy and discourse, embedding market logic through managerialism, accountability, and performativity (Codd, 2008). Grounded in an ideology that prioritises individualism, efficiency, and competition, neoliberalism frames education systems as businesses serving market needs (Bell, 2003; Goldspink, 2007; Hayward, 2012; Irwin, 2007; Savage, 2017). It privileges the individual over the

collective, the human over the environment, the industrialised over the non-industrialised societies (McKenzie, 2012). As Barnoff et al. (2017) contend, this worldview positions citizens as self-interested and economically accountable actors. Neoliberalism operates simultaneously as an ideology, a mode of governance, and a policy framework (Stegar & Roy, 2010), institutionalising performativity and market rationality across education. The result is a commercial managerial culture that constrains the emancipatory potential of schooling and limits its capacity to support sustainability, equity, and democratic renewal.

As an ideology, neoliberalism promotes consumerism and individualism, positioning personal success and purchasing power as measures of wellbeing (Block et al., 2016; McKenzie, 2012). This "Free-Market Consumer Ideology" (Block et al., 2016, p. xvii) normalises overconsumption and detachment from ecological limits, encouraging people to act on impulse and to conflate identity with material accumulation (Biesta, 2017; Harvey, 2019; Lipovetsky, 2011, 2014). As a form of governance, it embeds market logic into institutions, including schools, where leaders manage budgets and performance data as if they were business metrics (Hursh et al., 2015; O'Neill, 2015). Competition and accountability shape teachers and students as entrepreneurial, self-regulating actors rather than relational citizens (Giroux, 2005). Finally, through policy, neoliberalism manifests in decentralisation, privatisation, and data-driven performance measurement (Savage, 2017). In Aotearoa New Zealand, initiatives such as the Ministry of Education's *Investment Approach* (MoE, 2016b) align schooling with economic objectives, positioning learners as future contributors to workforce productivity. Collectively, neoliberal ideology, governance, and policy construct an education system that privileges efficiency and competition over the ethical, ecological, and democratic values necessary for a sustainable future.

Economic Models for Sustainability Education

The dominance of neoliberal ideology in education has extended into sustainability discourse, where market-based logic continues to shape how environmental issues are conceptualised and addressed. As education has become increasingly tied to economic agendas, environmental education has emerged as both a response and a counter-narrative, seeking to reorient learning toward ecological care and collective responsibility. International frameworks such as the *Belgrade charter* (UNESCO-UNEP, 1976) and the *Tbilisi declaration* (UNESCO-UNEP, 1978), were early milestones in reframing education's purpose toward social transformation and environmental stewardship (Edwards, 2016). Since then, a range of economic models have sought to integrate sustainability into mainstream policy and education, reflecting ongoing tensions between ecological integrity and economic growth.

One of the most influential frameworks is Elkington's (1994) *Triple Bottom Line* (TBL) model, which redefined value creation across three dimensions: people, planet, and profit (Elkington, 2004, 2010). Originally a provocation to rethink capitalism's future, the TBL was later institutionalised as a management tool, emphasising measurement and performance indicators that often reinforce

economic priorities (Mulligan, 2018). Responding to its institutionalisation, Elkington (2018) reimagined it as “triple helix for value creation” that regenerates economies, societies, and ecosystems (para. 17). When applied in sustainability education, the TBL metaphor invites reflection on how learning itself might generate value beyond economics, cultivating social wellbeing and ecological awareness alongside graduate employability.

The *Three Pillars of Sustainable Development* model also known as the *three Es* (Murray, 2011) offers a similar tripartite framing through economic, social, and environmental pillars but has been criticised for implying separateness and trade-offs between its components (Mulligan, 2018). Later adaptations depict the pillars as overlapping and interdependent, or include culture as a fourth dimension, acknowledging that sustainability relies on synergy between human, ecological, and cultural systems (Osman et al., 2017). This conceptual shift aligns with educational approaches that emphasise thinking and interconnection rather than compartmentalised knowledge.

The Social Ecology model is a more integrative framework that situates economic activity within the broader contexts of social wellbeing and ecological interdependence (Mulligan, 2018). It moves beyond the transactional logic of neoliberal economics, encouraging learners to consider the reciprocal relationships between people, place, and planet. This perspective is reflected in the United Nations education frameworks (UNESCO, 2017) which promote learning that engages the cognitive, affective, and behavioural domains to support transformative sustainability practices.

The United Nations and the Politics of Sustainable Development

As global concern for sustainability grew, international organisations, most notably the United Nations (UN), positioned themselves as leaders in framing sustainability education. Given its global authority, the UN appeared well placed to articulate a shared vision for sustainable futures. Its discourse has been widely critiqued as a hegemonic narrative, reflecting Western cultural assumptions and neoliberal economic priorities rather than a pluralistic vision of sustainability (Bengtsson et al., 2018; Berryman & Sauvé, 2016; Brissett & Mitter, 2017).

The terms *Sustainable Development* (SD) and *Education for Sustainable Development* (ESD) have been highly contested since their inception, carrying divergent and sometimes contradictory meanings (Escobar, 1995; Redclift, 2006; Sterling, 2001). Emerging from mid-twentieth-century debates on agriculture and conservation, *sustainable development* entered international policy through the 1972 *Stockholm Conference on the Human Environment,* where it was framed as a strategy for aligning economic growth with environmental protection. This framing, later institutionalised in the 1987 *Brundtland report,* redefined sustainability as a developmental pathway rather than an ecological limit, embedding the language of growth within the very concept of sustainability itself.

The Brundtland Commission’s definition, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987, p.

41), gained political traction because it allowed governments to align sustainability with continued economic expansion. Critics argue that this ambiguity transformed sustainability from a radical ecological challenge into a technocratic project compatible with capitalist development (Escobar, 1995; Le Grange, 2017; Redclift, 2006). Sustainable development became a policy instrument that reconciled environmental protection with the pursuit of modernisation, reinforcing rather than questioning the neoliberal order (Bourn, 2015).

Following the *Brundtland report*, the UN launched a series of global initiatives to embed sustainability within education. The 1992 *Earth Summit* in Rio de Janeiro and *Agenda 21* (UNESCO, 1992) marked a turning point, identifying education as a key mechanism for achieving sustainable development. This led to the *United Nations Decade of Education for Sustainable Development (2005-2014)*, coordinated by UNESCO, which sought to integrate sustainability principles across curricula and teacher education. While the initiative advanced awareness and curriculum reform globally, critics argue that it framed sustainability primarily as an issue of behaviour change and policy compliance, not systemic transformation (Berryman & Sauvé, 2016).

The UN's subsequent frameworks, including the *Global Action Programme on ESD (2014-2019)* and the *Sustainable Development Goals (SDGs)* launched in 2015, reinforced this policy trajectory. Goal 4.7 positioned education as a means of fostering "knowledge, skills, values, and attitudes" for sustainable development (UNESCO, 2017, p. 7). However, educational leaders and academics have questioned whether such instrumental framings risk reducing education to a delivery mechanism for policy objectives (Bengtsson et al., 2018). Le Grange (2017) and Wals (2015) argue that when ESD is framed within the logic of efficiency and accountability, it reproduces the very systems that have created unsustainability.

The purpose and objectives of both ESD and the SDGs remain contested. Educational researchers such as Kopnina (2018) and Brissett and Mitter (2017) argue that while these frameworks aspire to global justice and sustainability, they are often constrained by neoliberal assumptions that privilege measurement, standards, and outcomes over transformative learning. Lotz-Sisitka (2017) and Brissett and Mitter (2017) further contend that reclaiming education from these constraints requires reclaiming the commons - reimagining education as a shared, democratic, and relational process rather than a technocratic system of benchmarks. Despite these tensions, frameworks such as *Education for Sustainable Development: Learning Objectives* (UNESCO, 2017) and the *Commonwealth Framework for Education for Sustainable Development* (Osman et al., 2017) remain valuable tools for educators. Their attention to the cognitive, affective, and behavioural domains of learning provides practical guidance for embedding sustainability in teaching and curriculum design. When used critically, these resources can support holistic, place-based, and reflexive pedagogies that connect global goals with local realities. At the same time, even as the ESD discourse reflects ongoing ideological contestation, it continues to offer meaningful opportunities for educators to foster ecological awareness, ethical reasoning, and collective responsibility.

These global frameworks demonstrate both the promise and the limitations of international sustainability education. Their universalist ambitions have provided educators worldwide with common language and practical tools. Their standardised approaches, however, often overlook the cultural, ecological, and historical specificities that shape local contexts. In Aotearoa New Zealand, these tensions are particularly visible. Efforts to embed sustainability education have increasingly sought to engage with Te Ao Māori, a Māori world view that emphasises relationality, reciprocity, and kinship with the natural world. This shift represents not only a localisation of ESD principles but also an epistemological challenge to Western models of development. The following section examines how Indigenous perspectives reframe sustainability education, offering pathways toward more place-responsive and transformative ways of learning.

Mātauranga Māori and Sustainability Education in Aotearoa New Zealand

In Aotearoa New Zealand, sustainability education is increasingly informed by the recognition that Indigenous knowledge systems provide essential insights into the interdependence between humans and the environment. As the global sustainability movement continues to evolve, it is becoming increasingly clear that the dominant Western frameworks often entrenched in extraction, consumption, and individualism, are insufficient to address the complex, interconnected challenges we face. These frameworks separate humans from the natural world, reinforcing a hierarchy that places human needs above ecological limits. In contrast, Indigenous perspectives offer a fundamentally different way of understanding our place in the world, one that is relational, reciprocal, and founded on respect for the interconnectedness of life. The following section explores these perspectives, drawing on Indigenous knowledge systems, particularly, Mātauranga Māori, as it challenges the dominant narritives and offers alternate pathways toward a more equitable and sustainable future.

Mātauranga Māori encompasses Māori values, practices, and epistemologies. It emphasises whakapapa, the genealogical connections linking people, place, and all living entities, offering a more relational approach to being in the world (Lange, 2017). These relationships position humans as part of an interconnected web of life, a perspective central to Māori sustainability ethics (Durie, 2003; Penetito, 2009; Royal, 2005), and one that contrast with Western ontology, which often locates identity in consumption, the central aim of consumer capitalism (Block et al., 2016; Mulligan, 2018). Lange (2004) argues for a return to these kinship ethics. Harmsworth and Awatere (2013) describe kaitiakitanga, the ethic of guardianship, as foundational to environmental responsibility, expressing reciprocal care between people and ecosystems. Kaitiakitanga is the foundation for human wellbeing as it explains the dependency upon the vitality of the land and water, aligning with Lange's (2017) assertion that sustainability arises from understanding "individuals-in-relations", a genuine transformation that requires a shift "from the mode of having to the mode of being" (p. 41). This change focuses on *how* we are in the world rather than *who* we are or *what* we do, transformation toward embracing our way of being in the world.

This relational ontology contrasts sharply with the dominant Western worldview, which historically privileged separation, individualism, and control over nature. Indigenous epistemologies, in contrast, are holistic, embodied, and situated within relationships of reciprocity (Magni, 2017; Meyer, 2013; Ritchie, 2020). Meyer's (2013) concept of holographic epistemology, where body, mind, and spirit converge as three beams of light forming a single hologram of meaning, illustrates how learning occurs through interconnected experience rather than abstraction. Translated into Māori, these dimensions correspond to mōhiotanga (embodied knowing), mātauranga (knowledge and wisdom), and māramatanga (enlightened understanding). The metaphor of a hologram illustrates that knowledge is not compartmentalised but rather relational and simultaneous, a living whole. It aligns with Royal's (2005) argument that Indigenous knowledge seeks better relationships between human communities and the natural world, weaves cross-disciplinary boundaries, and revitalises ancestral wisdom.

Such epistemological frameworks call for a deeper ethical orientation within education, one that values interdependence, empathy, and collective responsibility as essential elements of sustainability. However, the integration of Indigenous perspectives into mainstream education is complex and demands ethical sensitivity. Challenges include the risk of appropriation and decontextualisation when Indigenous knowledge is incorporated superficially or detached from its cultural and spiritual foundations (Berryman & Sauvé, 2016; Magni, 2017; Ritchie, 2020). The risk of conflating knowledge systems or reducing Indigenous ideas to token curricular additions perpetuates what has been termed "epistemic racism", that is the marginalisation of non-Western ways of knowing (Andreotti et al., 2015, p. 23). Furthermore, colonisation's enduring legacy manifests in language loss, perceived socio-economic disadvantage, and distrust of education institutions, making collaboration contingent on strong, respectful relationships between schools and Māori communities (Bishop et al., 2018; Penetito, 2009).

Relational accountability and ethical engagement are essential to cross-cultural educational design (Magni, 2017; Ritchie, 2020). These approaches recognise the cultural interface (Nakata, 2007), a conceptual space where knowledge systems interact dialectically rather than in opposition. Within this space, Mātauranga Māori and Western science can co-exist, enriching each other when Indigenous leadership and localised decision-making guide integration. This view aligns with UNESCO's (2017) Education for Sustainable Development (ESD), which engages learners across the cognitive, affective, and behavioural domains to develop knowledge, empathy, and action that are locally grounded and culturally responsive.

Throsby and Petetskaya (2016) argue that culture plays a crucial role in the sustainability paradigm. It invites educators to move beyond instrumental views of sustainability toward a relational ethic of care grounded in place, community, and ancestry. This approach holds potential to reorient education toward values that sustain both human and ecological flourishing, including whanaungatanga (relationships), kaitiakitanga (guardianship), and mauri ora (wellbeing).

Summary of Ideologies Shaping Sustainability Education

Part One has established that capitalist and neoliberal ideologies underpin the structural and conceptual foundations of modern education, framing it as a vehicle mainly for economic growth rather than ecological or social renewal. Within this ideological framing, sustainability education becomes constrained by performative, utilitarian, and anthropocentric logics. Alternative epistemologies, particularly those grounded in Indigenous knowledge and social ecology, offer vital counterpoints that re-centre interdependence, cultural wisdom, and environmental responsibility. Part Two builds on these conceptual tensions, examining practical and theoretical responses to the challenges posed by neoliberal paradigms and exploring how professional learning might support teachers to embed transformative sustainability education in their practice.

Part Two

Responses to the Challenges of Dominant Ideologies

This section examines theoretical frameworks and practical approaches that offer responses to the challenges within education, that were presented in Part One. Beginning with the concept of *Oikos*, our common home, the discussion first considers how Marxist critical theory exposes the alienation created by dominant economic systems. It then examines Bourdieu's concept of *habitus* and its implications for education as a vehicle for social change. The review proceeds to consider how a social mandate for transformation might be created, emphasising the importance of cultivating a pedagogy of hope within sustainability education. It also analyses distinctions between education *in*, *about*, and *for* the environment before concluding with an examination of professional learning and development needs for teachers engaged in sustainability education.

Through this exploration of theoretical frameworks and practical approaches, this section identifies pathways for educators to navigate and challenge the constraints imposed by dominant ideologies in contemporary education systems.

Oikos - Our Common Home

One way to conceptualise Earth is through the idea of the *commons*. The commons refer to shared spaces, resources, and systems that belong to everyone and require collective responsibility (Berryman & Sauvé, 2016; Gibson-Graham et al., 2016; Hardin, 1968; Lotz-Sisitka, 2017). Another expression of this idea is *Oikos*, meaning *our common home*. Pope Francis (2015a, 2015b) explains, Oikos as everyone living together in a shared house, urging humanity to care collectively for that home. His encyclical, *Laudato Si'* communicates the extent of ecological disrepair and links this crisis to a throw away culture, appealing to all to reconsider how we shape our planet's future. Pope Francis also identifies the ecological crisis a moral and spiritual challenge, calling for the renewal of relationships with God, one another, and the created world. Similarly, Monbiot (2017, 2018) calls for a politics of belonging rooted in community and collective action, while Cloud (2009) emphasises the shared responsibility to reconcile individual rights with collective obligations as citizens of the Earth.

Berryman and Sauvé (2016) articulate an educational approach grounded in this ethos:

> Education is about learning to relate to our individual and collective self, constructing identity, learning to live alterity with human and other life forms, and to relate to our Oikos, our shared house of life... It is about ecosophy, ethics, esthetics, politics and economics (*eco-nomein*). The huge philosophical, theoretical, and practical heritage of environmental education… focusing on our human relationship with and within Oikos, can contribute to inspire such a holistic pedagogical project, as an important transversal part of it… (p. 112)

Engagement with such approaches requires individuals to recognise their collective responsibility in protecting the commons. This entails *commoning* practices that include not only human communities but also the more-than-human world, moving away from a capitalocentric framing of shared resources (Gibson-Graham, 1996). As Bhaskar notes, “Society arises out of nature, and the more we differentiate ourselves from it, the more problems we have” (as cited in Scott, 2015, p. 41). Block et al. (2016) argue that individualism, the ‘all I care about is myself’ mentality, undermines the common good and community, fuelling the mechanistic free-market consumer paradigm. In contrast, both Block et al. (2016), and Monbiot (2017) propose restoring community and humanity through localisation as an alternative to globalisation. This approach is countercultural to the current development narrative, focussing instead on responding to the needs of the Earth and its people through ethical and spiritual values (Kerber, 2015).

To understand why such countercultural approaches struggle to gain traction within existing educational systems, it is useful to turn to Marxist critical theory, which exposes the alienation produced by capitalist structures and their effects on human and ecological relationships. As discussed in Part One, within a capitalist framework, education is often positioned as a market solution for addressing economic and social challenges, prioritising the development of human capital over ecological consciousness, and preparing students for the workforce rather than for critical engagement with sustainability (Klees, 2020).

Marxist Critical Theory and Alienation

Marxist critical theory provides a framework for understanding how capitalist economic systems shape both social and ecological relationships. Central to this analysis is the concept of alienation: the ways in which individualism, commercialisation, and consumerism, constructed and reinforced through Neoliberal discourse, undermine communal values and collective responsibility for shared resources. Marx argued that capitalism alienates people from their labour, from each other, and from the natural world, reducing social and ecological relationships to economic transactions. This alienation masks the structural conditions of exploitation and environmental degradation, making systemic critique difficult. Critical theory builds on this foundation, offering analytical tools to examine

how power operates through educational institutions and to explore pathways toward empowerment and transformation. Recognising alienation becomes essential for cultivating the shared responsibility necessary to protect the commons and advance sustainability.

Harvey (2018) elaborates on Marx's concept, tracing alienation to the exchange of labour for wages under capitalist systems. Workers experience alienation when they exchange their intelligence and skills to produce capital while receiving only the value of their labour in return. Beyond the workplace, Harvey argues that alienation manifests as a "loss of trust, fairness or reciprocity often hidden in some exchange" (2018, p. 426), evident in globalisation processes, worker exploitation, and land dispossession. Perhaps most pervasively, alienation appears in widespread discontent with work and daily life, where lack of satisfaction drives what Harvey calls *compensation consumerism*. To fill this void, individuals turn to consumption to meet their ever-changing wants, needs, and desires (Harvey, 2018). Wallimann (1981) applies this analysis to human-nature relationships, arguing that estrangement from the more-than-human world lies at the heart of both ecological and social crises, requiring restored connections as a pathway toward restoration.

Many models of critical theory exist in educational discourse sharing a common aim: generating knowledge that is both "cultural and structural", grounded in "historical situatedness" and "praxis" (Denzin & Lincoln, 2000, p. 160). Applied to sustainability education, this approach interrogates the contested language and meanings of sustainability itself, concepts shaped by historical, social, political, cultural, economic, and ethnic values. Lincoln and Guba (2000) locate critical theory's axiology in transactional knowing as a pathway toward social emancipation, with truth and knowledge emerging through social critique rather than objective observation. Actions within the framework centre on empowerment, anticipated emancipation, and social transformation (p. 172). Kinchloe and McLaren (2000) contend societies are less democratic and free than commonly assumed; through acculturation, individuals remain largely unaware of power relations and subordination, precisely the structures critical theory seeks to expose and challenge.

This critical lens reveals education's contradictory role within capitalist systems. Bowles and Gintis (1976) theorised schooling as fundamentally reproductive of capitalist structures, a view Kinchloe and McLaren (2000) later characterised as schools functioning as "capitalist agencies of social, economic, cultural, and bureaucratic reproduction" (p. 280). Despite this critique, the belief that education can help reform or move society away from its individualistic, neoliberal focus is reflected in many recent publications by pan-global organisations (Osman et al., 2017; UNESCO, 2015, 2017). These frameworks emphasise holistic and lifelong learning through pedagogical approaches such as action-oriented learning, collaboration, problem-solving, and experiential engagement grounded in students' lived realities (Osman et al., 2017; UNESCO, 2017). The aspiration is for critical, pragmatic approaches that integrate knowledge, values, and social relations in ways that empower learners for transformative action (Giroux, 1988; UNESCO, 2017). Whether education can fulfil this emancipatory promise while embedded within structures it seeks to transform remains a central

tension in sustainability education discourse. Responding to this alienation requires reconnecting learners with the social and ecological systems that sustain life: cultivating an awareness of interdependence, community, and collective agency. These principles directly challenge the isolating logic of neoliberal individualism and reorient education toward relational, transformative ends.

Habitus: Education for Social Change

If education is to challenge alienation and neoliberal individualism that was discussed in Part One, it must address the deeply ingrained habits and dispositions that shape how people behave and relate to the world (Bourdieu, 1990). In modern society, particularly in the hyper-individualistic Western world, these patterns significantly influence everyday life. Increasingly, the demands of consumerism for individual gain erode both environment sustainability and social connections (Block et al., 2016; Mulligan, 2018). It is only by transforming these everyday habits and routines that conditions for social change can emerge. Bourdieu (1990) refers to these ingrained behaviours and dispositions as *habitus*: the habitual ways individuals understand the social world around them and respond to it. These are shaped by their social background, class, religion, nationality, education, and profession.

Habitus is tied to a person's unique position in the world, but it is also collectively shaped by group culture and personal history (Bourdieu, 1981). This dual nature, simultaneously individual and collective, makes habitus both a barrier and a potential site for transformation. Fien (1993b) argues that the root causes of environmental problems are embedded within the very structure of social, economic, and political systems, as well as in the worldviews, institutions, and lifestyle choices that perpetuate them. If these problems are structurally reproduced through habitus, then challenging them requires cultivating alternative dispositions and practices. Karole and Gale (2004) propose an alternative: a *habitus of sustainability* built on what they term *environmental capital* - a hybrid of cultural and economic capital that emphasises how people relate to interconnected environmental systems. This reframing suggests that sustainability education must not work to solely transmit knowledge, but to transform the embodied dispositions through which learners engage with social and ecological systems.

Education plays a key role in creating this habitus of sustainability. Developing sustainable dispositions requires pedagogical approaches that engage learners with complexity, disrupt taken-for-granted routines, and connect learning to meaningful action. Hipkins (2021) explains how students can be supported to develop thinking habits through "educating for complexity", emphasising the importance of nurturing responsible citizens who can understand and navigate the complex, interconnected systems as system thinkers (p. 107). This cognitive dimension must be paired with disruption of existing patterns. VanWynsberghe and Herman (2015) highlight how disrupting habits and routines can spark creative action, which is essential for driving social change. Disruption alone, however, is insufficient without meaningful contexts for reconstruction. Dewey's pragmatist philosophy emphasises that learning occurs through action and shared experience, with

participation in social environments leading to transformation, not only in individuals but also in collective understanding (Biesta, 2016; Dewey, 2008a). What makes this learning transformative, rather than adaptive, is its connection to what matters in learners' lives. Perkins (2016) introduces the concept of *lifeworthy learning*, which prioritises knowledge that is meaningful, ethical, and adaptive for students' lives both now and in the future. By fostering student agency and enabling learners to apply knowledge to real-world challenges, education can transform habitus from a mechanism of reproduction into a site of purposeful, collective reimagining.

These pedagogical principles are found in policy frameworks such as the New Zealand Curriculum (MoE, 2007), which promotes core values including ecological sustainability, community participation, and integrity. Realising these principles in practice, however, requires attention to how pedagogy shapes not just what students know, but who they become. Within the school environment, pedagogy extends beyond knowledge acquisition to the shaping of values, dispositions, and social relationships. Kemmis et al. (2014a) argue that holistic learning takes place as students notice, name, and reframe their experiences, positioning themselves in relation to others and the world around them. This iterative process of reflection and repositioning is inherently social: as students participate in shared practices, these experiences become a powerful means of transforming not only their individual perspectives but also the collective cultural and social frameworks they inhabit. Developing a habitus of sustainability, therefore, depends on creating educational environments where students can collectively question existing dispositions, experiment with alternative ways of being, and experience the possibilities of transformed social-ecological relationships.

Creating a Social Mandate: Education for Social Change in Aotearoa New Zealand

The challenge of transforming habitus into a site of collective change requires pedagogical frameworks. In Aotearoa New Zealand, the action competence model has emerged as a key approach for developing the kind of purposeful, community-oriented agency necessary for sustainability. Rooted in pragmatic constructivism, this model positions disruption and experimentation as essential to transformative learning. VanWynsberghe and Herman (2015) describe a "redesign of education" aimed at fostering social change by "adopting a pragmatist-inspired theory that suggests that important learning takes place when our habits are frustrated, and we are forced to develop creative action" (p. 280). Rather than treating discomfort as something to be avoided, action competence approaches harness it as a catalyst for reflection, innovation, action, and ultimately, social transformation. Morgensen and Schnack (2010) position action competence as an educational ideal fundamentally linked to democratic and political education, emphasising humanistic values such as responsibility and the capacity to act with the community in mind. What distinguishes this approach from individual agency is its explicitly collective orientation where learners develop competence for participating in shared efforts toward social and ecological restoration rather than for personal gain.

Action competence has become central to contemporary understandings of sustainability pedagogy. Wals (2015) and Wals and Lenglet (2016) advocate for action-oriented, transformative learning that integrates the cognitive, affective, and behavioural domains (Osman et al., 2017; UNESCO, 2017). Within the frameworks developed to support the Sustainable Development Goals (SDGs), this integration positions action competence as essential for holistic learning and transformation. The question of how this competence develops in practice, however, requires closer attention to pedagogical process.

Drawing on constructivist theory, Huckle and Sterling (1996) argue that EfS should be "process driven, participatory and empowering, is liberating and continuous" (p. xiv), advocating for transformational approaches that engage students in active, real-world learning. Jensen (2002) similarly stresses that the action competence model must be student-centred, democratic, and involve active engagement with sustainability issues. Jenkins (2015) adds that for EfS actions to lead to positive outcomes, they must be future-focused, situated in context, and strongly connected to the curriculum. Together, these writers, emphasise process, participation, and contextual relevance as necessary conditions. There is a risk, however, that these frameworks risk oversimplification if EfS is reduced to a sequence of steps rather than sustained, place-based practice.

Lucas' (1972, 1979) tripartite environmental model, education *in*, *about* and *for* the environment, offers a foundational framework for understanding how action competence fits within EfS. However, this categorisation, while useful, cannot fully capture the scope of contemporary sustainability education in Aotearoa New Zealand. EfS here is necessarily broader, encompassing localised engagement with family and communities, addressing concerns that span local to global scales, urban to natural environments, and integrating citizenship, social justice, equity, culture, and wellbeing. Rather than existing as discrete domains, these dimensions interact dynamically within place-based contexts. In this sense, EfS integrates both individual and collective responsibility, providing a pathway toward lifelong learning and sustainable action grounded in the specific social-ecological relationships that shape learners' lives.

Towards a Pedagogy of Hope: The Role of Education in Aotearoa New Zealand

If sustainability education is to foster the collective action competence described above, it must address fundamental pedagogical challenges: how to engage learners with urgent global crises without succumbing to paralysis or despair. While pedagogical approaches vary, researchers broadly agree that a reframing education is critical to addressing current global challenges (Biesta, 2016, 2017; Jickling & Sterling, 2017; Wals, 2015). Central to this reframing is what Freire (1992) termed a pedagogy of hope, an approach that resists the disempowerment and hopelessness that can arise when confronting overwhelming problems while remaining grounded in realistic engagement with complex realities (Kopnina, 2014; Wals, 2015; Weil, 2016).

Freire (1992) defines hope as “an ontological need”, and essential part of being human. Critically, however, he insists that hope “demands anchoring in practice” (p. 2). This grounding distinguishes hope from wishful optimism. Hope must be woven into the lived experience of education, emerging from authentic engagement rather than abstract aspiration. EfS embodies this active hope, aiming to empower learners to imagine and work towards more sustainable futures (Hicks, 2002; MoEb, 2022; Sterling, 2001). Freire’s (1992) conception of a *discourse of possibility* captures this transformative potential, when learners engage meaningfully with real-world challenges at local, regional, and global scales, where collaboration and problem-solving become sources of collective empowerment (p. 184). Through these learning opportunities, students experience their own agency and cultivate a hope-filled visions grounded in tangible action rather than abstract idealism.

Evidence from Aotearoa New Zealand supports the transformative potential of this approach. Harré et al., (2017) found that participants identified infinite values such as connection, nature, personal strengths, vitality, and spirituality as central to their lives (p. 342). When presented with a word cloud reflecting these values, participants responded with feelings of belonging, reassurance, and uplifted hope. The researchers interpreted this “*tale of joy”* as evidence that people do care deeply about the common good, directly challenging neoliberal narratives of self-interest (p. 342). Tilbury (2019) frames the challenge powerfully: do schools and educational institutions act as mirrors, merely reproducing society’s existing problems, or beacons that light up new pathways for change? For Tilbury, education must be transformative and fit for purpose, requiring fundamental shifts in educational systems to realise this potential.

Despite this optimistic framing of hope as a pedagogical principle, it is not without critique. Dahlbeck (2014) summarises Nietzsche and Spinoza’s starkly different view of hope, not as liberation but as a tool for governing people. From this perspective, hope functions as “manipulation”, “obedient anticipation”, and a “ball and chain” that binds individuals to anxiety and fear (p. 158). Both philosophers connect hope to fear, particularly in religious and political contexts, framing it as an instrument of control that inhibits rather than empowers (Dahlbeck, 2014, pp. 158-160). This critique serves as important caution against forms of hope that defer action to distant futures or rely on technical solutions. However, the hope advocated by Freire and contemporary EfS academic writers differs fundamentally. It is anchored in current practice, emerges from collective engagement, and generates agency rather than passivity. This study aligns with the belief that education grounded in hope and authentic engagement can inspire agency, resilience, and action for a better world, a vision reflected in Aotearoa New Zealand’s environmental education framework, which emphasises education *in, about*, and *for* the environment (MoE, 1999).

Pathways to Sustainability: Evolving Environmental Education

In Aotearoa New Zealand, following a series of international conferences and growing awareness of environmental issues, the Ministry of Education published the ‘*Guidelines for environmental education in New Zealand schools*’ (MoE, 1999). These guidelines provided a resource to support

schools and teachers in the implementation of environmental education (EE). Central to the framework was Lucas' tripartite model (1972, 1979), which defined environmental education as being comprised of three key dimensions*:* education *in*, *about* and *for* the environment. Lucas' model sought to strengthen understanding and practice by moving beyond traditional science-based approaches (Edwards, 2016). Instead, it promoted a more holistic view that integrated attitudes and values alongside knowledge, awareness, and action. By including education *for* the environment, Lucus (1972, 1979) highlighted the need for active engagement and experiential learning to address environmental concerns.

The idea that environmental education should move beyond awareness to foster transformational and purposeful action lies at the heart of education *for* the environment. Fien (1993b) describes education *for* the environment, as having "an overt agenda of values education and social change" (p. 16). It seeks to engage students in exploring and resolving environmental issues, aiming to "foster the values … [and] promote lifestyles that are compatible with the sustainable and equitable use of resources" (Fien, 1993b, p. 16). These activities *for* the environment closely align with what current sustainability pedagogy recognises as *action competence*. This approach involves engaging learners in critical thinking and problem-solving around real-world sustainability challenges. Jensen and Schnack (1997) and Morgensen and Schnack (2010) argue that action competence is essential in preparing students for the future, typically involving participatory learning and teaching methods. I would argue that action competence pedagogy represents the *how*, the missing piece that Orr (2016) identifies as absent from decades of literature emphasising humanity's responsibility for the planet's fate (p. 14).

Although Lucas' tripartite model (1972, 1979) can be seen as a holistic approach to environmental education, Edwards (2016) presents a contrasting view. Concerns have been raised with the third dimension of Lucas' model, education *for* the environment. Gough (1987) critiques this component as remaining anthropocentric, arguing that it objectifies human-environment relationships. He notes that the model does not account for alternative worldviews, such as those found in deep ecology, which emphasise the interconnectedness of human and natural systems as part of a shared existence (Edwards, 2016). The concept of learning *with* environments, advanced by Gough and Gough (2010), offers a more "radical, socially critical pedagogy" (p. 132) that reframes this relationship. It moves beyond teaching *about*, *in*, or even *for* the environment, positioning learners as co-participants in environmental processes through decision making, engagement, and real-world involvement.

Since the late 1990s, the discourse around environmental education in Aotearoa New Zealand has evolved toward a broader framework known as Education for Sustainability (EfS). EfS builds on the foundational principles of environmental education but extends its focus to include intergenerational responsibility, systems thinking, transformative action, and futures thinking (Eames et al., 2009; Jenkins, 2015; Taylor et al., 2015). Within Aotearoa New Zealand's curriculum, EfS is supported

through resources available on digital platforms such as Te Kete Ipurangi (MoE, 2022b) and its updated version, Tāhūrangi (MoE, 2024).

According to MoE (2024), EfS functions both as a pedagogical approach and a guiding philosophy that promotes the wellbeing of people and planet. It encourages ways of thinking and acting that foster sustainability, grounded in the understanding that human wellbeing is intrinsically connected to the health of the environment. This idea is captured in the whakataukī (Māori proverb):

Mō tatou te taiao ko tea tawhai,

Mō tatou te taiao ko te oranga.

It is for us to care for and look after the environment to ensure its wellbeing,

in doing so we ensure our own wellbeing and that of future generations. (MoE, 2022b)

The key concepts and values central to EfS include sustainability, interdependence, connectedness, equity, and participation for change (Bolstad et al., 2008; Eames et al., 2009; MoE, 2022b, 2024). The Ministry of Education envisions that teaching these ideas will support transformative learning, enabling students to critically engage with sustainability challenges and take informed, collective action to improve the world around them. For this vision to be realised, however, teachers must have a clear understanding of the sayings, doings, and relatings (Kemmis et al., 2014) that constitute EfS practice. This highlights the crucial role of teacher professional learning and development, which is explored in the next section.

Empowering Aotearoa New Zealand Teachers for Sustainability Education

Sustainability and sustainability education, with all their nuances, continue to pose conceptual and practical challenges. Questions persist about the language, intent, and processes of change required to embed sustainability in education. Since the Earth Summit in 1992, *Agenda 21* has positioned education as a critical agent for achieving sustainable development, calling for all nations, including Aotearoa New Zealand, to integrate sustainability into all levels of learning.

In Aotearoa New Zealand, the language of sustainability began to emerge within educational discourse during the late 1980s and 1990s, reflecting a growing international awareness of environmental and social interdependence. One point of broad agreement in Aotearoa New Zealand literature is the urgent need to move from an economic-growth paradigm to a sustainability paradigm (Eames et al., 2010; Parliamentary Commissioner for the Environment, 2002). However, the persistence of development language, within policy and practice continues to blur this distinction, reinforcing a tension between economic priorities and ecological responsibility.

Irwin (2007) cautions that, the rhetoric of sustainability can perpetuate rather than transform modern consumer culture, enabling society to overlook mounting evidence of environmental degradation and

climate change. Addressing this disconnect requires that sustainability education actively engage with these underlying discourses. In particular, teacher professional learning and development must support critical reflection on prevailing assumptions and empower educators to adopt pedagogies that challenge unsustainable paradigms and foster transformative practice.

The challenge of translating sustainability principles into educational practice is compounded by the proliferation of frameworks and approaches. Tilbury (2019), in her plenary session at the *International Conference on Sustainability Education,* urged educators to "understand the challenge, understand the change, and rethink learning for change," pursued through learning to do, learning to be, learning to live together, and learning to know. The intent of the *Sustainability Education Framework for Teachers* (SEFT) (Warren et al., 2014) is to build teacher capacity in three areas: understanding the broad and complex nature of sustainability, recognising its problem-oriented, solution-driven character, and connecting it to their roles as citizens and classroom teacher. SEFT adopts four key ways of thinking: futures, values, systems, and strategic. Other frameworks, such as the *Curriculum Framework for the Sustainable Development Goals* (Osman et al., 2017), *Education for Sustainable Development Goals: Learning Objectives (*UNESCO, 2017); *The Sustainability Framework for ELT* (Blue, 2022) similarly seek to empower teachers to embed sustainability within their practice. However, while these frameworks provide valuable guidance, the diversity of models, approaches, and hybrid pedagogies can obscure shared understanding, contributing to the persistent complexity of sustainability education.

What is needed, is not another framework but a fundamental reframing of education's purpose and narrative. Monbiot (2018) proposes a restoration story that positions participation and belonging at the centre of community life, reimagining a balanced relationship between the state, the market, the household, and the commons, redefining economics as a tool for social transformation. Hayward (2012) frames this even more directly, asserting that "our sustainability crisis is a political crisis" (p. 12), highlighting the urgency of reframing education to respond to both political and social imperatives. Schools can become communities of transformation, replacing the dominant neoliberal narrative with one that helps students make sense of their world in generous and inclusive ways. Realising this vision, however, requires addressing the practical realities teachers face.

The challenges are well documented. Bolstad et al. (2015) identified persistent shortcomings in EE/EfS practice across Aotearoa New Zealand schools. To address these gaps, educators require sustained support, access to quality resources, and meaningful professional learning opportunities. For teachers to confidently integrate sustainability into their teaching practice and local curriculum design, they need not only clear understanding of sustainability principles and pedagogy but also access to collaborative spaces for co-constructing knowledge and sharing practices (Eames et al., 2009; Sterling, 2001; Wals & Mathie, 2022). Professional learning, understood as practice development rather than knowledge transmission, plays a critical role in translating sustainability's broad goals into practical, context-specific teaching strategies. One response to this need has been

the rise of informal, digitally mediated professional learning networks that operate outside traditional institutional structures.

Social Media as an Informal Professional Learning Tool for EfS

In the absence of a formal Ministry of Education advisory group supporting teachers in sustainability education, social media and online networks have emerged as alternative spaces for professional learning. Educators are increasingly turning to these platforms not only to share resources but also to engage in ongoing professional development. Mostafa (2020) attributes this trend to the immediacy of information, ease of access, and opportunities for collaboration with like-minded peers. Globally, organisations such as TeachSDGs and EcoSchools leverage social media to connect educators, share best practices, and build communities of learning around sustainability education. Similarly, non-governmental organisations (NGOs) such as UNICEF and WWF use social media to translate the United Nations Sustainable Development Goals into practical, actionable resources for schools. These networks demonstrate the potential of online platforms to enhance access to sustainability-focused resources and support teacher learning, though questions remain about their reach, quality, and pedagogical coherence.

In Aotearoa New Zealand, informal social media-based professional learning is already well established among teachers. The Facebook group, NZ Teachers (Primary), has over 44,000 members who regularly share ideas, resources, and support. Despite this high level of engagement, social media is not widely utilised as a structured space for EfS learning. The New Zealand Association of Environmental Education (NZAEE) has recently redesigned its website as a hub for resources and professional learning opportunities, while Science Learning Hub, Pokapū Akoranga Pūtaiao, and Tāhūrangi provide curriculum-aligned materials relevant to EfS. It remains unclear, however, how widely these platforms are known or utilised by teachers, or how effectively they support sustained pedagogical development. Without structured guidance, teachers seeking EfS support must navigate fragmented resources independently, a reality that reinforces the need for coordinated, evidence-based professional development in this area.

Beyond teacher-focused platforms, social media serves multiple functions in the sustainability education ecosystem. Government departments use it to disseminate information and promote sustainability initiatives. For instance, the Ministry of Foreign Affairs and Trade published its 2019 draft report on Aotearoa New Zealand's progress with the Sustainable Development Goals (SDGs) on Facebook. However, the report's 110 pages focus on broad aspirations rather than practical guidance for embedding sustainability in education or curriculum, illustrating a persistent gap between policy rhetoric and classroom practice.

More promising are youth-led sustainability movements that leverage social media for action and advocacy. A prominent example is the *Bye Bye Plastic Bags* campaign, launched by two students from Green School, Bali. Using platforms like Facebook, TED Talks, and other digital media, they

brought global attention to plastic pollution and inspired policy changes, including supermarket bans on plastic bags. Their campaign illustrates how digital activism can amplify youth voices, connect global and local concerns, and influence real-world change. These kinds of initiatives align closely with the United Nations Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production) and SDG 14 (Life Below Water), reflecting a growing global emphasis on citizen engagement and action competence

The educational implications of these movements, however, remains underexplored. While youth-led initiatives raise awareness and inspire change, their integration into formal education remains inconsistent. For schools to harness this energy productively, educators must be supported to engage students in meaningful, action-oriented learning and to make effective use of the growing range of available resources. This requires professional learning and development that goes beyond resource sharing to also address the pedagogical complexities of facilitating student agency, critical thinking, and sustained action for sustainability.

Professional Learning and Development for EfS

Professional learning and development (PLD) is integral to education in Aotearoa New Zealand, codified as one of six standards in the *Code and Standards for the Teaching Profession* (Education Council, 2017). Despite this formal recognition and its foundational role in teachers' ongoing development of knowledge and practice, PLD lacks clear definitional boundaries, creating ambiguity that complicates efforts to design effective professional learning for sustainability education.

Understanding what makes PLD effective requires attention to both process and context. Timperley et al.'s (2007) influential synthesis of 97 studies identified seven elements critical positive student impact: extended time; external expertise; active teacher participation; challenging assumptions; opportunities for professional community interaction; alignment with policy; and leadership involvement (p. xxvi). These elements show that effective PLD is not a discrete event or a standardised programme but a sustained, contextually responsive process that attends to cultural, material, and relational dimensions of practice.

In Aotearoa New Zealand, definitional complexity is reflected in varied understandings of PLDs scope and purpose. McChesney et al. (2024) associate it with both informal and formal professional learning opportunities, while the Ministry of Education frames it more instrumentally as "opportunities to strengthen teaching practice and educational leadership" (MoE, 2025a, para. 1). Guskey (2021) and Sims and Fletcher-Wood (2021) argue that effective PLD must shift from isolated events to continuous, a sustained process designed to reinforce changes in practice and ultimately improve student outcomes. This evolution requires attention to implementation, feedback, ongoing support, and integration of learning into the daily professional culture of the school (Guskey, 2021; King, 2014). Together, these perspectives reveal a tension between viewing PLD as discrete activities and understanding it as transformative learning within communities. How PLD is defined fundamentally

shapes which forms of teacher learning are valued, resourced, and enacted, with significant implications for sustainability education.

The investment of public funds in teacher PLD reflects the government's recognition of it as a lever for educational improvement. In Aotearoa New Zealand, the Ministry of Education (MoE) allocates substantial funding to national PLD priorities, which are periodically reviewed to align with political and policy agendas. This includes the creation and recent disestablishment of Kāhui Ako (Communities of learning) (MoE, 2025b), clusters of schools that collaborated on achievement challenges aligned with the *New Zealand Curriculum* (Education Counts, 2025; MoE, 2007). Such investments aim to promote equitable access to professional learning but also determine which areas of teacher learning are prioritised and which remain under-resourced. As a result, PLD becomes both an instrument of state policy and a site where ideological priorities, such as the current emphasis on literacy, mathematics, and assessment, are reinforced. While these investments can drive consistency and quality, they may also marginalise areas such as sustainability education, where outcomes are longer term and harder to quantify.

This marginalisation is not incidental but structural. National investment in PLD often privileges measurable outcomes in literacy and numeracy, leaving sustainability education with few opportunities for sustained, contextually relevant professional learning in Aotearoa New Zealand. The problem is compounded by shifting policy priorities and short-term funding cycles, which fragment professional development in sustainability education rather than embedding it systematically within school improvement agendas. As a result, EfS PLD often takes the form of project-based, externally funded initiatives rather than being integrated into ongoing practice development (Ferreira et al., 2006; Tilbury, 2011).

Research clearly indicates what effective EfS PLD requires. Studies both nationally and internationally (Eames et al., 2009; Sterling, 2001, 2004, 2017; Wals & Mathie, 2022) emphasise the need for long-term engagement, collaborative inquiry, and alignment between school culture and sustainability principles - in other words, a whole-school approach. Within such an approach, specific learning strategies are essential to achieve systemic change, including futures thinking, systems thinking, critical thinking, and values clarification (Cloud, 2017; Marschall & Crawford, 2022; Tilbury, 2011), competencies included in UNESCO's (2017) list of key competencies for sustainability.

The foundational understandings of EfS are further articulated through the work of key organisations and frameworks. For example, the Cloud Institute for Sustainability (Cloud, 2012) identifies core EfS standards that encompass and promote cultural preservation and transformation, responsible citizenship, systems and change dynamics, sustainable economics, stewardship of the commons, understanding the natural laws, future-oriented innovation, engaging with multiple perspectives, and a strong sense of place. Collectively, these principles reinforce the multidimensional and values-based nature of sustainability education. In Aotearoa New Zealand, this holistic orientation is

reflected in initiatives such as the *Enviroschools* programme, which integrates local curriculum design, community partnerships, and environmental action into school culture.

Effective EfS PLD must adopt holistic approaches that engage the affective (heart), cognitive (head), and behavioural (hands) domains of learning (Marschall & Crawford, 2022; Osman et al., 2017; Singleton, 2015; UNESCO, 2017), reinforcing that transformative professional learning must address the whole person, not just discrete competencies. Its impact also depends on connecting explicitly to the local curriculum, enabling teachers to situate sustainability learning within place-based contexts that reflect the values, histories, and priorities of their communities (Alberti, 2017; Bagnall, 2016; Bolstad et al., 2015; MoE, 2018; UNESCO, 2017). Together, these insights highlight that sustainability education is as much about reconfiguring the systems and relationships that sustain teaching as it is about developing new pedagogical knowledge.

This understanding aligns with Schatzki's (2000; 2005; 2012) conception of site ontology, in which practices are embedded in site-specific practice-arrangement bundles, where cultural, material, and social resources interact to shape both what PLD is and how it functions. Building on this ontological foundation, Kemmis and colleagues (Kemmis & Grootenboer, 2008; Kemmis et al., 2014) developed the theory of practice architectures to analyse how these bundles operate in educational settings. Practice architectures consist of three interrelated dimensions: cultural-discursive (the language and ideas that make meaning), material-economic (the activity and work enabled or constrained by physical, spatial, and temporal resources), and social-political (the relationships between people that define participation and roles) (Kemmis et al., 2014). From this perspective, professional learning cannot be separated from the contexts in which teachers work. The discourses that circulate through schools, the material resources available, and the social relationships that enable or constrain practice all shape what learning becomes possible. For sustainability education, this suggests that effective PLD must address not only teachers' knowledge and skills but also the practice architectures within which EfS is enacted.

Chapter Summary

Empowering teachers in Aotearoa New Zealand with evidence-based, culturally responsive strategies for sustainability education is a complex and ongoing endeavour. It depends on collaboration, sustained professional learning, and inclusive engagement across educational communities. As this chapter has demonstrated, realising this vision requires a shift away from the historical and political ideologies that have shaped education, toward the integration of Indigenous perspectives, the alignment of teaching with local contexts, and the development of pedagogical practices that connect learners meaningfully with place. When these elements converge, educators are better positioned to design curricula that are relevant to their students, responsive to their communities, and oriented toward sustainable futures. This foundation not only nurtures environmentally literate and socially conscious citizens but also contributes to a more sustainable and equitable education system.

From this understanding emerges the central focus of the present inquiry: to examine how professional learning can support teachers to embed sustainability education in their practice and curriculum design. The following chapter outlines the methodological approach adopted in this study, which investigated how the characteristics of sustainability education and local curriculum design (SELCD) were enabled and constrained by practice arrangements (Kemmis et al., 2014) within a case study school. Grounded in the theory of practice architectures and informed by critical participatory action research, the study explored how the cultural-discursive, material-economic, and socio-political arrangements shaped the conditions for teachers' professional learning and pedagogical enactment of sustainability education. The next chapter also details the methods used for data collection and analysis to highlight these dynamics.

Chapter Three

Research Philosophy and Design

The study was guided by the overarching question of this thesis: *How can professional learning support teachers to embed sustainability education in their teaching practice and local curriculum design?* The primary aim of this research was to explore how the characteristics of sustainability education and local curriculum design (SELCD) were enabled and constrained through various practice arrangements within a case study school.

This research examined how professional development influenced teaching practices and positioned sustainability education as a catalyst for social change. As argued by Sterling (2001), sustainability education requires a transformational shift in pedagogy, moving beyond traditional content delivery towards participatory, action-oriented learning. In response, this study sought to shift educational priorities away from market-driven approaches toward a holistic, sustainability-centred model that emphasises environmental responsibility, social equity, and critical thinking in curriculum design and teaching practice. Grounded in principles of social action and critical inquiry (Freire, 1970), the study explored how teachers interpreted their professional learning experiences and sustainability education within the school and classroom context.

Alongside this, the research used the theory of practice architectures (Kemmis, 2022; Kemmis et al., 2014b) to analyse and understand the cultural-discursive, material-economic, and social-political conditions within the school that shaped teaching practices and professional learning opportunities, particularly for sustainability education. Research on effective professional learning (Cochran-Smith & Lytle, 2009; Guskey, 2000; Timperly et al., 2007) highlights the importance of collaborative, practice-based learning, which was a key consideration in this study.

Given the study's focus on understanding the contexts that promote, support, and embed sustainability education in an Aotearoa New Zealand primary school's local curriculum, a qualitative research design was most appropriate. This chapter outlines and justifies the qualitative methodology guiding the study, detailing the case study design and research tools used. Theoretical perspectives are introduced first, followed by an explanation of research processes and procedures, including ethical considerations.

Conceptual Framework

To explore the lived experience of sustainability education, the study examined perspectives from both the school leaders and classroom teachers, particularly in relation to professional learning and its influence on embedding sustainability within local curriculum planning. Drawing on the theory of practice architectures (Kemmis, 2022; Kemmis et al., 2014b; Kemmis & Mutton, 2012), the research identified how cultural-discursive, material-economic, and social-political arrangements within the school shaped teachers' sayings, doings, and relatings. These interrelated elements contributed to

new understandings of sustainability education and teacher professional development in this context.

Understanding how these structural arrangements shape educational experiences required a critical lens. Critical theory, first developed by a group of German scholars in the 1920s, is concerned with analysing and transforming social institutions by examining the meanings of social life within them (Morrow & Brown, 1994). Horkheimer (1972) defines critical theory as an approach that not only critiques societal structures but also seeks to emancipate individuals from oppressive conditions. It recognises that alternative possibilities exist beyond dominant narratives of power, control, and alienation. As Kinchloe and McLaren (2000) argue, critical social theory has the power to "disrupt and challenge the status quo" (p. 279), making it a useful lens for investigating education systems where experiences and knowledge are socially constructed.

While critical theory critiques dominant structures, the transformative paradigm extends this by providing a framework for action-oriented research. Paradigms shape the assumptions underlying research, influencing what is considered valid knowledge and how inquiry is approached (Cohen et al., 2011, Punch, 2014; Schnelker, 2006). Mertens (2019) categorises critical theory within the transformative paradigm, which emphasises equity, social justice, and research that fosters change. The borders between paradigms are permeable (Mertens, 2019), allowing research to draw from multiple frameworks. In the context of sustainability education, research approaches, theories, and frameworks often align with constructivist, transformative, and pragmatic paradigms. However, this study is best positioned within the transformative paradigm, as it aligns with my epistemological stance and the study's aim, to examine how sustainability education, local curriculum design, and professional learning and development can drive curriculum and social change.

By integrating critical theory within the transformative paradigm, this study not only critiques existing educational structures but also identifies pathways for transformation. As Bohman (2021) asserts, critical theory allows researchers to "explain what is wrong with current social reality, identify the actors to change it, and provide both clear norms for criticism and achievable practical goals for social transformation" (p. 2). This aligns with the overarching intention of transformative research, which is to promote social democracy and empowerment (Cohen et al., 2000; Stefurak et al., 2016).

Mertens et al. (2013) reinforce this stating, "Transformative research seeks to challenge the status quo of an oppressive, hegemonic system in order to bring about a more equitable society" (p. 484). Within this paradigm, researchers aim to facilitate change by engaging deeply with communities, ensuring research is meaningful and beneficial (Creswell, 2014; Mertens, 2019). As a primary school teacher and a teacher educator, I have experienced curriculum shifts, policy changes, and societal transformations firsthand. These experiences have highlighted the need for research that generates knowledge capable of influencing everyday practice in schools (Lisahunter et al., 2013).

A study framed within a transformative lens has the potential to contribute to both individual and societal change by advocating an action agenda. In the context of primary school education, this approach acknowledges and challenges the power dynamics within education systems and school communities. Drawing on Freire's (1992/2014) *pedagogy of hope*, it seeks to empower teachers to ''unveil opportunities of hope" (p. 3) by addressing pressing social and environmental concerns through sustainability education. Stradz (2019) expands on this idea, advocating for *radical hope*, a combination of critical and transformative hope, built on Webb's (2013) five pedagogies of hope: patient, critical, sound, resolute, and transformative. Stradz argues that critical-transformative hope or radical hope is "rooted in context, provides a point of departure, and is realized through action" (p. 6), reinforcing the importance of social action and collective agency in schools (Flessner & Payne, 2017).

In a primary school setting, collective action involves working within local communities to address issues of equity and oppression, whether related to ethnicity, disability, immigration status, poverty, gender, or environmental sustainability (Mertens, 2010). Schools are not isolated from broader political structures, and research in this space inevitably intersects with educational policy and political agendas (as evidenced by shifts in professional learning and development priorities during this research due to government changes). This study, therefore, engages in critical, participatory and action-oriented research that not only analyses but also contributes to changes in school practices and professional development (Lisahunter et al., 2013).

Biesta (2017) argues that education be understood as participation in a common world, rather than simply knowledge acquisition. He suggests that education fosters dialogue between individual desires and the realities of the wider social and ecological contexts in which we live. This view aligns with sustainability education, which challenges traditional educational paradigms by promoting collective engagement, critical inquiry, and ethical responsibility. However, one of the ongoing challenges in sustainability education is the continued ambiguity surrounding the concept of sustainability itself. Defining sustainability only serves to highlight the diverse range of meanings and underlying theories associated with the concept. Each definition may be shaped by a person's cultural, historical, and geographical context, their beliefs and values, their societal role, and even political agendas. Furthermore, various terms Environmental Education (EE), Education for Sustainable Development (ESD), Education for Sustainability (EfS), Environmental Education for Sustainability (EEfS) each carry their own educational and ideological nuances.

As sustainability education has evolved, so too have the pedagogies associated with it. Transformational Sustainability Education (TSE), as described by Burns (2018), embodies a relational ontological approach to sustainability education. Burns regards TSE as having the potential for "restorative possibilities, creative connections, and an invitation to engage with teaching and learning as part of a relational whole" (2018, p. 279). These restorative possibilities align with a

pedagogy of hope, a radical hope, that is deeply embedded in relationality and interconnectedness (Freire, 1992/2014; Lange, 2017; Stradtz, 2019).

By applying the theory of practice architectures as both a theoretical and analytical resource as described by Mahon et al. (2017), this study positions it as a transformational tool for professional practice in schools. By examining the practice architectures that enable or constrain sustainability education, this research seeks to uncover pathways for meaningful educational change. Through participatory and action-oriented research, it aims to contribute not only to teacher professional learning but also to broader curriculum transformation in Aotearoa New Zealand primary schools.

The Theory of Practice Architectures

The theory of practice architectures (TPA) sits within the broader field of practice theory, which examines how social practices are structured, sustained, and transformed over time. Drawing on theorists such as Bourdieu and Schatzki, practice theory highlights how historical, cultural, and material conditions shape practices while also opening possibilities for change. TPA extends these ideas by analysing the social arrangements that enable or constrain particular practices (Mahon et al., 2017). It functions as a theoretical, methodological, and transformational resource for understanding and interrogating educational practice.

Before outlining its application to this study, it is useful to summarise its foundational principles. Grootenboer and Edwards-Groves (2023) identify three key principles that are foundational to TPA.

1. A theoretical and linguistic perspective - using conceptual language to interpret social realities.
2. A critical stance - evaluating whether practices enable or constrain self-expression, growth, and autonomy, and whether they are just or unjust.
3. A practical and transformative aspect - supporting the development of practices in response to social, environmental, cultural, and political challenges.

These principles emphasise that meaningful change requires addressing both underlying structures and the social arrangements that hold practices in place (Kemmis et al., 2014b). TPA is therefore not only an analytical framework but also a tool for praxis (Mahon, et. al., 2017). This study uses TPA to examine how professional learning and school structures shape sustainability education, building on Kemmis and Mutton's (2012) work in Education for Sustainability (EfS) initiatives in Australia. The framework provides a lens for analysing conditions that enable or constrain educational change, particularly in relation to teacher professional learning and curriculum transformation.

Professional development for teachers has, as Edwards-Groves (2018) describes, become "a diet of rhetoric bundled up as 'best practice'" (p. 120), often framed as pre-packaged solutions rather than meaningful professional inquiry. This study, while incorporating professional development to

support teachers' engagement in sustainability education and local curriculum design, does not aim to provide "a bounded package of solutions or approaches to instruction" (Edwards-Groves, 2018, p. 120). Instead, following Schatzki's (1996) perspective, the unique needs of the school site and the practices within it have been considered. Foundational to this approach is the belief that relationships within social phenomena are intertwined, complex, and fluid. For this reason, the theory of practice architectures has been used to examine the social dynamics within the school, particularly in relation to teacher professional development and sustainability education.

As Mahon et al. (2017) note, research using TPA is inherently research for praxis, seeking to analyse and transform practice. In this study, this meant collaborating with teachers to identify and address the conditions that shape sustainability education within local curriculum design. According to Kemmis and Grootenboer (2008), Kemmis et al. (2014b), and Kemmis (2022), educational transformation is made possible through the three intersubjective spaces that shape the conditions for change:

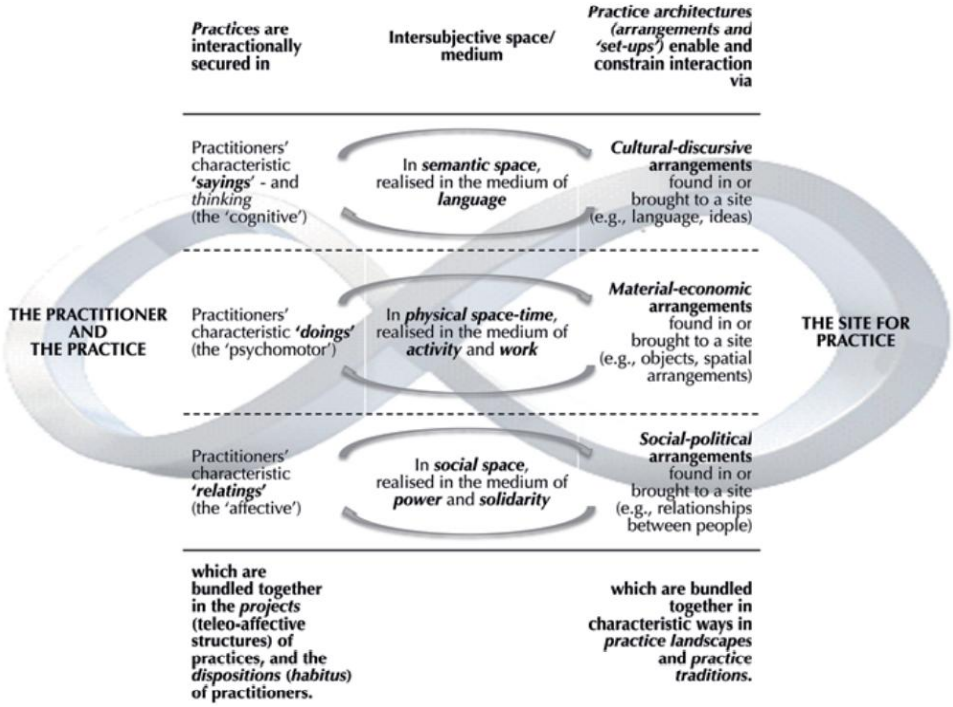
1. Semantic space - produced through language used in the school setting.
2. Physical space-time - the ways in which people in the school carry out their work.
3. Social space - the relationships between people and resources, forming connections in the school setting.

These three spatial domains sit between individual teaching practices and the broader systems, structures, and arrangements of the school. Examining them helps uncover opportunities for transformation. TPA also reconnects with the *lifeworld* perspective of practice as a human and social activity with enduring moral, political, and historical dimensions. It supports analysis of the cognitive, behavioural/ psychomotor, and affective elements of practice - known as sayings, doings and relatings (Kemmis et al., 2014b; Lisahunter et al., 2013; Ronnerman & Kemmis, 2016), depicted in Figure 1. The lens of practice architectures was used in this case study to examine the arrangements that hold sustainability practice in place and to deepen understanding of sustainability pedagogy as social practice. The case study explored the social, physical, and political conditions influencing teaching practices across cognitive, behavioural, and affective domains.

Overall, TPA provided a framework for analysing how sustainability practices interrelate and how each is shaped by others. It guided the examination of cultural discursive (language and ideas), material-economic (objects and space), and social-political (relationships and power) arrangements within the school. Semi-structured interviews and focus group questions, as well as the analytical tables used to present findings, were all informed by this framework.

Figure 1

The Theory of Practice and Practice Architectures



Note. Reprinted from *Changing Practices, Changing Education* (p. 38), by S. Kemmis, J. Wilkinson, C. Edwards-Groves, I. Hardy, P. Grootenboer, and L. Bristol, (2014), Springer. Copyright 2014 by Springer Nature. Reprinted with permission.

The Research Approach - Methodologies

As there is no prescribed methodology for investigating sustainability education, Reunamo and Pipere (2011) suggest researchers explore relevant approaches and adapt research design as needed. A key challenge in selecting a methodology for school-based research is the inherent complexity of sustainability and sustainability education. In a climate where terminology continuously evolves, shaped by various political agendas and the dynamics of change, a disconnect persists between theory and practice in Aotearoa New Zealand primary schools (Brignall-Theyer et al., 2009; Eames et al., 2010). Similar challenges appear internationally, where sustainability remains a contested concept, often lacking clear definition or understanding.

Bolstad et al., (2015) note a shortage of professional development opportunities to support teachers in applying sustainability education pedagogy, as well as limited relevant resources and teaching examples. While changes in government PLD priorities in 2019 initially created an opportunity for sustainability education to be embedded in local curriculum design, subsequent policy shifts redirected the focus toward literacy and numeracy.

In response to these ongoing challenges, a practice-based case study approach was adopted for this research. Within this approach, critical participatory action research (CPAR) provided a framework that balanced structure with flexibility, facilitating iterative cycles of reflection and action through collaborative inquiry and supporting the transformation of sustainability education as practice within the school (Kemmis et al., 2014a). The study was further informed by the theory of practice architectures (Kemmis et al., 2014b), which offered an analytical lens for critically examining the cultural-discursive, material-economic, and social-political conditions that enabled or constrained sustainability education and professional learning within the school setting.

Case Study Strategy

This research adopted a case study approach, with critical participatory action research (CPAR) providing the methodological foundation and guided by a theory of practice architectures. The case study served as the overarching research design, enabling an in-depth exploration of how sustainability education can be embedded in local curriculum design. Within this design, CPAR guided the iterative cycles of inquiry and collaboration with teacher participants. Its emphasis on collective meaning-making aligned with the study's aim to co-construct professional learning and supported an examination of how practices were shaped by the cultural-discursive, material-economic, and social-political arrangements of the school. The fuller rationale for adopting CPAR is outlined in the subsequent section on action research.

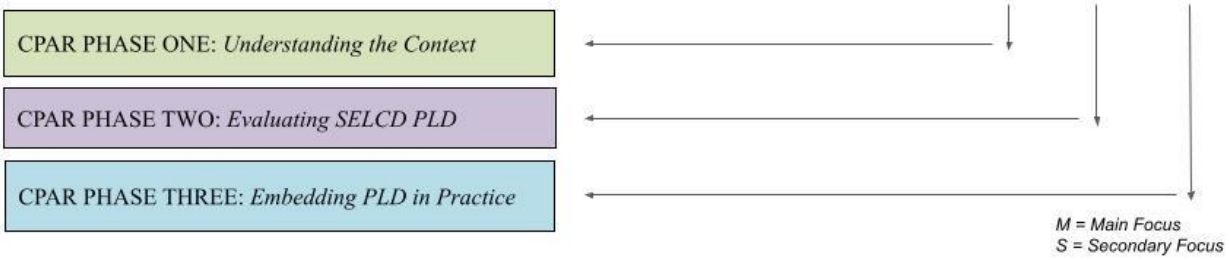
Within the broader landscape of case study methodologies, this research is best understood as a single instrumental case study. The case (the school) was not examined for its own sake but was used to gain insight into the wider phenomenon of how teachers engage in sustainability education and local curriculum design (Stake, 2005). The instrumental nature of the case aligns with the case study's aim to understand and improve professional learning processes rather than to describe the school as an isolated entity. Furthermore, by analysing professional learning through the theory of practice architectures, this study operates as a practice-based case study in which sayings, doings, and relatings provide the primary analytical lenses.

Case study research is one of several forms of social science research, focusing on the complexity and essence of a specific case. A case can be understood as an investigation of a present-day phenomenon within its real-life context, drawing on multiple sources of evidence (Ashley, 2017). According to Yin (2014), a case study is the preferred method when: (1) the main research questions ask "how" or "why"; (2) the researcher has little or no control over behavioural events; and (3) the study examines a contemporary, rather than historical, phenomenon" (p. 2). In this study the overarching research question, *How can professional learning support teachers to embed sustainability education in their teaching practice and local curriculum design?* is further supported by three sub-questions, each aligned with the research aims of the critical participatory action research phases. These are outlined in Table 1 on the following page.

Table 1

Research Aims, Questions and CPAR Phases

Research aim	Research question	CPAR Phases		
		One	Two	Three
1. To critically analyse characteristics of sustainability and how sustainability education is conceptualised in the school site.	What characteristics of sustainability education are evident in the case study school?	*M*		*S*
2. To evaluate sustainability PLD and synthesize how practice arrangements in the case study school might enable sustainability education and local curriculum design.	How might professional learning be arranged to further enable sustainability education practice to be developed?		*M*	*S*
3. To interpret from multiple perspectives, understandings of situations where PLD informs school curriculum and classroom practice.	How does sustainability education professional learning shape local curriculum design and teaching practice?		*S*	*M*



While a case study can focus on an individual, institution, event, or project, its strength lies in the depth of exploration it allows. A case can be defined as a specific subject, such as an issue, situation, relationship, environment, or setting (Bryman & Bell, 2007). This research, which examined teacher professional learning and development was best suited to a single case study site. This single-school case study allowed for an in-depth exploration and analysis of practice architectures and the implementation of sustainability education PLD in local curriculum design, aligning with the primary objective of descriptive research (Hedges, 2017).

A case study approach was selected to develop a comprehensive understanding of how PLD can support teachers in embedding sustainability education in their teaching practice and local curriculum design. One of the key advantages of a case study strategy is its ability to offer a 'holistic' and 'real-world perspective' through rich data collection (Punch & Oancea, 2014; Yin, 2014). The goal of this study was not to generalise findings, but to understand the case within its specific context. Methodological triangulation, incorporating interviews, and focus groups, along with analysis triangulation, including practice architectures analysis and thematic analysis, ensured a robust and multifaceted examination of the data (Mills et al., 2012).

While Zaborek (2009) advocates for multiple case studies in doctoral research to enhance subjectivity, a single case study is more appropriate for this research. The focus on teacher professional learning and development within one school allowed for an in-depth analysis of practice

architectures and the implementation of sustainability education PLD in local curriculum design, contributing valuable insights to the broader discourse on sustainability education.

Action Research

Investigating sustainability education required a research design that not only explores its pedagogical foundations but also examines how it is embedded into local curriculum design. This was important because sustainability education seeks to prepare students to engage with real-world social, environmental, and economic challenges (Agirreazkuenaga, 2019; Osman et al., 2017; Taylor et al., 2015). To support this, the methodology needed to be closely aligned with teaching practice and capable of generating practical, context-driven change.

Action research is widely used in educational research for this reason: it links research with practice in a purposeful and iterative way (Gibson & Blake, 2018). Drawing on critical theory foundations relevant to sustainability education, this study employed a critical participatory action research strategy (Robson, 2002; Sandretto, 2008). As first described by Lewin (1946), action research seeks to generate knowledge about social systems while simultaneously working to transform them. In educational contexts, this means research is not only about examining practice but also about refining it through cycles of action and reflection.

A defining feature of action research is its cyclical, inductive, and reflective process (Lisahunter et. al., 2013; Munn-Giddings, 2017; Punch, 2014). Levin and Greenwood (2013) describe it as a strategy capable of balancing rigour and relevance, with significant transformative potential. Because sustainability education emphasises action, agency, and preparation for sustainable futures, action research aligns well with its aims by enabling educators to develop and refine practices in real time. In this study, the iterative cycles focused specifically on planning, delivering, and reflecting on professional development to support sustainability education within the school.

However, a recurring critique of action research is that participants often have limited involvement in data interpretation and meaning making (Keifer-Boyd, 2012). While teachers may contribute to changes in practice, they are not always fully engaged as co-researchers in interpreting findings. To address this limitation, more collaborative and emancipatory forms have emerged. Critical participatory action research (CPAR) is one such refinement, explicitly seeking to position participants as co-researchers who work alongside the researcher to interpret findings, generate knowledge, and enact change (Erickson, 2013; Munn-Giddings, 2017). In this study, while action research provides the overarching methodological family, CPAR forms the specific approach adopted.

Critical Participatory Action Research

Participatory action research (PAR) bridges social research and social action with participant collaboration as foundational (Munn-Giddings, 2017; Punch, 2014). Conducted within participants'

natural settings, PAR positions teachers and the researcher as co-constructors of meaning, with participants' perspectives central to the process (Burns, 2000). It is research *with* rather than *for* the participants, recognising their diverse experiences and the reflective opportunities that come from being engaged in their professional context (Levin & Greenwood, 2013). Critical participatory action research (CPAR) supports the co-development of practical solutions to challenges faced by teachers. Drawing on Lewin's (1946) recursive cycle of planning action, fact finding, and evaluation, CPAR encourages reflection in and on action alongside critical reflection (Cohen et al., 2011; Lisahunter et. al., 2013). These reflective processes enable participants to become co-producers of local knowledge while identifying, reflecting, and acting upon complex and multifaceted issues (Cachelin et al., 2016; Erickson, 2013). In line with McTaggart et al. (2016), CPAR is concerned with improving practice and confronting the underlying conditions that make practices irrational, unsustainable, or unjust. Through iterative cycles of collective self-reflection, CPAR supports participants to identify when practices limit self-expression or coherence (irrational), when they are ineffective or non-renewable over time (unsustainable), or when they privilege some groups over others and constrain self-determination (unjust). This moral-critical dimension positions CPAR as a methodology that seeks both understanding and transformation, aligning strongly with the aims of sustainability education.

CPAR is closely aligned with the theory of practice architectures, which understands social practices as being shaped by cultural-discursive, material-economic, and social-political arrangements (Kemmis et al., 2014b). In CPAR, changing a practice is not just a matter of individual reflection or behaviour modification; it requires disrupting or reconfiguring the practice architectures that prefigure and hold existing practices in place. This connection between CPAR and TPA is particularly relevant to sustainability education, where meaningful change depends on reshaping the sayings, doings, and relatings of teaching, as well as the structural conditions that enable or constrain them.

Given its emphasis on local knowledge and practitioner experience, CPAR is the most relevant methodology for this project. Its valuing of knowledge generated from participants and the researcher aligns with the Māori concept of *ako*, grounded in the principle of reciprocity and reflective practice (MoE, 2011). Educational research demonstrates that effectiveness of reciprocal teaching and learning roles (Alton-Lee, 2003; Berryman & Eley, 2017; Maitland, 2020; MoE, 2013). In a research context, *ako* affirms methodologies that value and respect participants' contributions. Embedding *ako* within this project honours the principles of Te Tiriti o Waitangi and aligns with the philosophical foundations of CPAR.

This research also aligns with Dewey's pragmatist philosophy (Heinemann & Defalco, 1992) and Biesta's (2016, 2017) argument for value-based and inquiry-driven education. CPAR provided a platform to explore participants' lived experiences within their learning community and to engage with the evolving discourse of sustainability education. In doing so, it shifted sustainability PLD from externally imposed theories to internally driven practices led by teachers, creating the potential to

disrupt the status quo, reshape beliefs, and ground learning in the realities of teaching and curriculum design. This methodological stance supported an examination of how sustainability education and local curriculum design PLD could help teachers apply value-based principles to curriculum design (Biesta, 2010), aligning with Perkins (2016) notion of *life-worthy learning*.

To answer the primary research question, three sub-questions were developed, each forming the focus of one CPAR phase. These phases involved iterative cycles of reflection and understanding, planning, action, and observation. A summary of how each research question aligned with the corresponding CPAR Phase is provided in Table 2 on page 56. Each cycle of the CPAR was guided by the framework of practice architectures.

Researcher Positionality and Reflexivity

As both the researcher and facilitator of the Sustainability Education and Local Curriculum Design Professional Learning and Development (SELCD PLD), I was aware that my cultural background and position would shape how sustainability education was introduced and explored within the case study school. As a Pākehā (white New Zealander of European descent), I recognised that I was an outsider to Mātauranga Māori (Māori knowledge systems) and needed to engage thoughtfully and respectfully with Māori knowledge systems.

Positioning myself within Aotearoa New Zealand's bicultural context, I understood that my responsibilities were informed by Te Tiriti o Waitangi. Te Tiriti principles of partnership, participation, and protection (MoE, 2017) required me to work alongside Māori educators and knowledge holders and to ensure that Māori concepts were represented with accuracy, integrity, and cultural authority. Upholding Te Tiriti meant recognising rangatiratanga (Māori authority over their own knowledge) and avoiding practices that might misappropriate or dilute cultural concepts.

Understanding the historical, cultural, and environmental context of the local area was therefore an essential first step. I also acknowledged the risks of unintentially misrepresenting Māori concepts within sustainability education. As Enviroschools (n.d.) suggests, I positioned myself in an appreciative stance, seeking to listen, learn, and broaden my perspective, rather than attempt to embody knowledge that is not inherently mine. To ensure the integration of Mātauranga Māori (traditional Māori knowledge) and concepts related to Te Taiao (our natural world) within the SELCD PLD was culturally appropriate and pedagogically meaningful, I collaborated with knowledge guardians, cultural advisors, and Māori experts. Their guidance supported an approach grounded in reciprocity and respect, consistent with both Te Tiriti obligations and the Kaupapa of sustainability education.

Throughout the research process, I remained committed to critical reflexivity, questioning how my own cultural background, assumptions, and role influenced the study. By positioning participants as co-researchers, the study sought to create an authentic space where teachers' voices, experiences,and perspectives shaped both the research process and its outcomes. For consistency,

this thesis refers to the teachers involved in the research as *teacher participants* to acknowledge their dual role as educators and co-researchers within the critical participatory action research process. All teacher participants were actively engaged in the data analysis, interpretation, and decision making.

Ultimately, the goal was to contribute to the broader discourse on sustainability education in Aotearoa in ways that honour Te Tiriti o Waitangi and ensure that professional learning and curriculum development reflect diverse perspectives and knowledge systems.

Research Design: Phases and Questions

Recruitment of a Case Study School

This research was conducted within a single case study school site to address the main research question: *'How can professional learning support teachers to embed sustainability education in their teaching practice and local curriculum design?'*

To recruit a participant school, an invitational email was sent to primary school principals, initially in the Tauranga region, and then extending to rural schools within a two-hour radius (see Appendix A). The email outlined the selection criteria, emphasising the importance of engaging a school already involved in sustainability education and local curriculum design and interested in deepening its commitment through PLD. Additionally, the recruitment letter detailed the purpose of this critical participatory action research (CPAR) project, including the level of commitment required from the school and teachers. Participation was voluntary, allowing schools to express interest in being considered for the study. The form granting permission to conduct research within the case study school can be found in Appendix B.

Although a clear sampling rationale was established to select a school from those responding to the recruitment email, only one school ultimately expressed interest, likely due to the pressures schools faced during Covid-19. The selection criteria included, but was not limited to:

- Primary schools in the Tauranga region or within a two-hour radius,
- Schools with prior engagement in sustainability education – either through external programmes and organisations such as Enviroschools or through their own curriculum initiatives,
- Schools interested in professional learning and development (PLD) related to sustainability education and local curriculum design, and
- Schools willing to commit to a full year of PLD.

Following the recruitment of a case study school, participant recruitment letters and consent forms were sent out via the principal to all staff (see Appendix C). The details of participant recruitment can be found in the section, 'Recruitment and Ethical Considerations', beginning on page 72. Participant consent forms can be viewed in Appendix D.

To generate data for this critical participatory action research (CPAR), qualitative methods were employed, using two main research tools: one-on-one semi-structured interviews and focus group discussions across three CPAR phases. Each phase was guided by a specific research aim and question. In total, two semi-structured interviews and five focus groups were conducted, with all sessions audio-recorded and transcribed. The transcriber confidentiality agreement can be viewed in Appendix E. The professional learning and development (PLD) sessions were designed in response to the data gathered from Interview One and Focus Groups One to Three. The SELCD PLD sessions were not recorded, and their content is not included in the formal analysis. Table 2 outlines the timeline for the implementation of data collection methods across the cycles in each of the three CPAR phases.

Table 2

Timeline of Data Generation Methods

Time Frame	Focus of Research	Description of Research	Data Generation
2022 Term 1	Recruit case study school	*Recruitment email sent to schools inviting participation in the research project.*	
Term 2	**Research Aim 1:** To critically analyse characteristics of sustainability and how sustainability education is conceptualised in the school site. **Research Question 1:** *What characteristics of sustainability education are evident in the case study school?*	**CPAR Phase 1:** Initial discussions with school leaders and teacher participants to establish collaboration, research scope, and timelines, etc.	Meeting
		Interview school leaders and teacher participants via Zoom to find out the characteristics of sustainability education evident in practice and how teacher participants are teaching sustainability.	Individual interviews 1
		Facilitate a focus group discussion with school leaders and teacher participants about professional development – related to experiences, practice arrangements, and sustainability education in local curriculum design.	Focus group 1 (FG1)
		Meet with school leaders and teacher participants to interpret and discuss data generated from interviews and FG1. Discuss CPAR & decide on PLD.	Focus group 2 (FG2)
2022 Term 3 & 4	**Research Aim 2:** To evaluate sustainability PLD and synthesise how practice arrangements in the case study school might enable sustainability education and local curriculum design. **Research Question 2:** *How might changes to practice arrangements further enable sustainability education in local curriculum design?*	**CPAR Phase 2:** *Plan and deliver PLD based on the school's needs, arising from consultation with school leaders and teacher participants (FG 1 & 2) and data analysis from the first round of interviews.*	
Term 4		Facilitate a focus group discussion with school leaders and teacher participants about the first five SELCD PLD sessions – related to PLD, practice arrangements, and sustainability education in local curriculum design.	Focus group 3 (FG3)
		Facilitate a focus group discussion with school leaders and teacher participants about all seven SELCD PLD sessions. Discuss practice arrangements and collaboratively plan the next PLD steps.	Focus group 4 (FG4)
		Interviews with all teacher participants to understand how practice arrangements and PLD enabled sustainability education in local curriculum design. Understand teachers' experiences of planning and teaching sustainability.	Individual interviews 2
2023 Term 1	**Research Aim 3:** To interpret from multiple perspectives, understandings of situations where PLD informs school curriculum and classroom practice. **Research Question 3:** *How does sustainability education professional learning shape local curriculum design and teaching practice?*	**CPAR Phase 3:** *Teachers implemented sustainability education within local curriculum over one term.*	
		Post-PLD focus group discussion to reflect on progress at the end of the school term. Discussion about planning and teaching sustainability within their local curriculum, reflecting on progress, limitations, and next steps.	Focus Group 5 (FG5)

CPAR Phase One: Understanding the Context

What characteristics of sustainability education are evident in the case study school?
To explore this question, semi-structured interviews were conducted with school leaders, teacher participants, and myself (see Appendix F). This cycle aimed to map the existing landscape of sustainability education and identify current practice arrangements to inform future professional learning and development (PLD). Initially, curriculum planning documents were intended as discussion prompts. However, as the interviews were conducted via Zoom, physical documents were not used, though planning was referenced in conversation.

Additionally, two focus group discussions were held. Originally planned with school leaders, the focus groups ultimately included the entire teaching team along with the leadership team. The questions used in these focus groups are listed in Appendix G.

- Focus Group One (FG1): Examined teacher participants' experiences and understandings of professional learning and development.
- Focus Group Two (FG2): Analysed themes emerging from individual interviews and FG1.

The findings from this phase guided the design and focus of sustainability education PLD, shaping the direction of CPAR Cycle Two.

CPAR Phase Two: Evaluating SELCD PLD

How might changes to practice arrangements further enable sustainability education in local curriculum design?
During this cycle, focus group discussions and semi-structured interviews were used to assess how PLD influenced sustainability education (see Appendix F and G for guiding questions).

- Focus Group Three (FG3): Conducted after five SELCD PLD sessions.
- Focus Group Four (FG4): Conducted after seven SELCD PLD sessions.

This cycle had two key aims:

1. To evaluate how the PLD supported teacher participants in embedding sustainability education in local curriculum design.
2. To assess how school practice arrangements facilitated sustainability-focused SELCD PLD.

The data analysis helped refine curriculum planning and PLD strategies. Themes emerging from interviews were compared with those from Cycle One, providing insights into evolving teaching practices. As with each PAR cycle, findings were collaboratively reviewed and used to adjust practice arrangements and site conditions, directly shaping sustainability education for the upcoming school year.

CPAR Phase Three: Embedding PLD in Practice

How does sustainability education professional learning shape local curriculum design and teaching practice?

This cycle followed the implementation of sustainability education PLD, delivered across two terms. The structure, content, and format of the PLD were shaped by insights from Cycle One and ongoing consultation with school leaders and teacher participants. The PLD focused on sustainability education practices framed by the practice architectures lens, which examined:

- Forms of Understanding (Sayings): Language, ideas, and concepts shaping sustainability education.
- Modes of Action (Doings): Practical enactment of sustainability education in teaching.
- Ways of Relating (Relatings): Relationships between teacher participants, students, and the school community.

During this phase, teacher participants planned and implemented sustainability education within their local curriculum. After one term of implementation, data was collected through a post-PLD focus group discussion (FG5):

- Focus Group Five (FG5): Evaluated PLD impact on teaching practice, discussing progress, strengths, limitations, and next steps (see Appendix G).

This third cycle had one key aim:

1. To interpret from multiple perspectives, how PLD shapes curriculum design and teaching practice.

Findings from this cycle were used to inform ongoing PLD, refine local curriculum design, and embed sustainability education practices into the school's long-term strategy.

Teacher participants

Having outlined the research phases and key questions guiding each CPAR cycle, this section introduces the teacher participants who engaged in the study. Understanding who was involved, their roles, and how they were selected provides important context for interpreting the findings and the collaborative, participatory nature of the research.

At the request of the school principal, all teachers and leaders in the school were sent an invitation to participate in the research (see Appendix C) and signed consent forms (Appendix D). In the original research design, the planned focus group sessions involved the senior leadership team, who would utilise the time to study the interview data and make decisions regarding the content, timing, and structure of the SELCD PLD. However, the principal preferred that the whole team be involved in these discussions so that the PLD reflected the perspectives of all staff and supported a shared

learning journey. While not all team members attended every focus group due to sickness and other commitments, this whole-team approach aligns with Schatzki's (2005) site ontology, in which the social life of the school is inherently linked to its context. It also reinforces arguments for a whole-school approach to sustainability education (Eames et al., 2013; Tilbury & Galvin, 2022; UNESCO, 2020) and supports the case for a localised curriculum (Alberti, 2017; Bolstad et al., 2015; MoE, 2018; UNESCO, 2017).

To facilitate this, it was essential to understand the teaching team within the site. Involving the whole team created a social space for the sharing of ideas, where teacher participants could discuss their practices in relation to sustainability education and local curriculum design. These discussions revealed teacher participants' sayings (thinking and understanding), doings (skills and capabilities), and relatings (values and feelings), concerning, professional development, and professional learning for sustainability education.

The study involved 12 teacher participants and school leaders, including the principal (although he did not participate in individual interviews). There were seven female and five male teacher participants, though not all were present for every data collection session. Including the entire teaching team was essential to gain a comprehensive understanding of the diverse perspectives informing the research questions. Teacher participants' backgrounds, teaching experience, professional learning journeys, and roles within the school shaped their views on sustainability education and local curriculum design. Just over half of the teaching team, seven out of twelve did not reside locally, while the remaining five commuted between 15 and 45 minutes to the school. This detail is relevant, as the SELCD PLD was contextualised to the local area, meaning local knowledge and familiarity with the environment influenced how teachers engaged with the learning, see Table 3.

While all teacher participants engaged in the study as co-researchers, their experiences, responsibilities, and decision-making authority influenced their contributions. At times, decision-making related to professional learning had to be deferred in the principal's absence, highlighting the influence of leadership roles, a theme explored further in the findings and discussion chapters. Most teacher participants selected their own pseudonyms, often choosing the names of well-known singers or names with personal significance. However, Luther and Sam did not select their own pseudonyms, nor did Ella, who joined the school toward the end of the research. To maintain consistency, pseudonyms were assigned to these teacher participants. For a detailed breakdown of the research teacher participants, see Table 3.

Table 3

Teacher Participant Information

Teacher Participant Pseudonyms	Gender	Ethnicity	Waka[4]	Iwi (i)[5] Hapū (h)[6]	Affiliated Marae[7]	Place of Residence	Time Teaching
P1 - Alicia	F	Māori	Tainui	Ngāti Raukawa (i)	Mangakaretū	OoT	BT
P2 - Rangi	F	Māori	Tainui	Ngāti Te Wehi (i)	Te Papatapu	Local	9 years
P3 - Mr T	M	Māori	Te Arawa	Ngāti Tūwharetoa (i)	Tokaanu	Local	9 years
P4 - Cardi	F	Māori	Tainui	Waikato-Tainui (i) Ngāti Mahuta (h)	Turangawaewae	Local	BT
P5 - Anna	M	Fijian Indian	-	-	-	OoT	35 years
P6 - Beyoncé	F	Māori	Mataatua	Ngāti Awa (i) Ngāi Tamawera (h)	Uiraroa	OoT	5 years
P7 - Mariah	F	Māori	Tainui	Waikato-Tainui (i) Ngāti Whāwhākia (h)	Kaitumutumutu	Local	1 year
P8 - Seamus	M	NZ European	-	-	-	OoT	22 years
P9 - Luther	M	NZ European	-	-	-	OoT	23 years
P10 - Sam	M	NZ European	-	-	-	OoT	BT
P11 - Fred	M	NZ European	-	-	-	OoT	8 years
P12 - Ella	F	Australian	-	-	-	Local	7 years

Note. BT = Beginning Teacher; OoT = Out of Town. Used to maintain participant anonymity while indicating non-local residence.

Recruitment and Ethical Considerations

Ethical approval for this study was granted by the Auckland University of Technology Ethics Committee (AUTEC) on 28 September, 2021 (see Appendix H). The school recruited for the study agreed to teachers participating as co-researchers and teacher participants, separate from their involvement in sustainability education and local curriculum design PLD. This agreement was indicated in the initial school recruitment letter. Participant selection, inclusion and exclusion criteria can be found in Table 4.

[4] A waka is a Māori canoe that brought a person's ancestors to Aotearoa New Zealand.
[5] Iwi is Māori tribal grouping – a kinship-based social and political unit.
[6] Hapū are a subtribe based on familial ties and people can belong to several different hapū.
[7] A marae is a sacred communal gathering place for Māori. A place for meetings, celebrations, and ceremonies, a fenced-in complex of carved buildings and grounds that belong to a particular iwi (tribe), hapū (sub-tribe), or whānau (family).

Table 4

Participant Selection: Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
• Registered Aotearoa New Zealand primary school teachers with a current practicing certificate (provisional, subject to confirmation, or full). • Teachers with some involvement in sustainability education, either through an external organisation or through existing school curriculum design. • Teachers from a primary school committed to sustainability education and local curriculum design PLD for two terms in 2022.	• Student teachers or pre-service teachers completing a field-based practicum in the school, as they are not fully registered teachers. • Teachers who have previously studied at Bethlehem Tertiary Institute (BTI) in the B.Ed. (Teaching) Primary degree course between 2013-2021. This is due to a potential conflict of interest, as I (the researcher) had taught courses related to sustainability education at BTI during this period.

Teacher participants were invited to engage in the critical participatory action research (CPAR) as co-researchers, with transparent communication maintained at all stages. An email address was provided for teacher participants to ask questions and seek clarification at any stage.

Social and cultural partnerships were prioritised throughout the research. The principle of manaakitanga (hospitality and respect) was central to ensuring that teacher participants felt comfortable expressing themselves and feel confident that their contributions would be treated with dignity (Bishop et al., 2018). The research partnership was outlined in the information sheets provided at each phase of the study. Teacher participants had the opportunity to review their transcripts, verify how their contributions were analysed, and clarify the meaning attributed to their responses. Each participant received a copy of their transcript for review and confirmation.

Participant Involvement in CPAR Phases

Throughout the CPAR process, teacher participants played an active role in shaping the sustainability and local curriculum design professional learning and development (SELCD PLD), which I, as the researcher, facilitated. In Phase One the team participated in a focus group discussion on professional learning in general (FG 1), and the data from the first round of individual interviews and FG1 were used in FG2 to inform the design of the initial PLD sessions. In Phase Two, further focus group discussions (FG3 and FG4) contributed to co-developing the content, structure, and delivery of ongoing SELCD PLD. Additional individual interviews provided further insight into how teacher participants engaged with sustainability education and the SELCD PLD. The final focus group in Phase Three (FG5), conducted after two terms of SELCD PLD and one term of teaching, allowed teacher participants to reflect on how the PLD influenced their teaching practice, what aspects were successful, what needed refining, and what further PLD might be beneficial. This participatory approach ensured that participant voices were central to shaping sustainability education professional learning and curriculum design.

Ensuring Participant Wellbeing and Ethical Integrity

The study aimed to create a research output that amplifies the collective voice of sustainability educators in Aotearoa. By positioning teacher participants as co-producers of knowledge, the research contributes to the ongoing dialogue around sustainability education and the integration of sustainability into local curriculum design. Participation was voluntary, and individuals retained the right to withdraw at any time without fear of coercion.

Teacher participants benefited from their involvement by; directly influencing the shape and content of SELCD PLD, applying these insights to their teaching practice, and engaging in dialogue with peers to determine what worked in their context. Findings from this study can also support future PLD providers in developing tailored or bespoke approaches aligned with the practice architectures that enable or constrain sustainability education in schools.

Teacher participants had agency in how they were referred to in documentation. They also had the right to review their transcripts before data analysis to verify authenticity. Throughout the research, respect for teacher participants' mana and narratives was upheld, reinforcing the co-production of knowledge as an ethical and methodological priority.

Using critical participatory action research (CPAR) positioned the researcher alongside rather than above teacher participants, ensuring that theory emerged from their experiences rather than being imposed. Across all phases of the research, safe and flexible spaces were created, allowing teacher participants to engage from their own social and cultural perspectives.

Data Collection Methods

To generate data in way that honoured these principles, two qualitative methods were used: semi-structured interviews and focus groups. These methods were selected to capture the experiences, perspectives, and evolving understandings of teacher participants throughout the research cycles.

Semi-structured Interviews

Connolly (2016) states that interviews are valuable for, "accessing participants' feelings, interpretations, beliefs or how they construct reality" (p. 39). Similarly, Mears, (2017) describes interviews "purposeful interactions" (p.183) that allow researchers to understand the experiences of teacher participants. In this study, semi-structured interviews were conducted to explore teacher participants' experiences with sustainability education and local curriculum design. Emerging themes from these interviews were collaboratively discussed with teacher participants during focus groups two and five (FG2 and FG5) to guide ongoing action throughout the research project and beyond.

Semi-structured interviews included pre-determined topics and initial questions, as well as follow-up questions and probes to encourage deeper responses (Connolly, 2016; Johnson & Turner, 2003). These interviews were used to gain insight into the experiences of teacher participants engaging in sustainability education and local curriculum design. Each participant took part in two interviews.

1. **First Interview (CPAR Cycle One):** Conducted at the beginning of the research to establish the school's existing sustainability practice landscape and professional development practice arrangements informing a plan for sustainability education PLD. The guiding questions for this interview are set out in Appendix F.
2. **Second Interview (CPAR Cycle Three):** Conducted after two terms of SELCD PLD. The aim of the interview was to evaluate the impact of the PLD, understand how sustainability education was beginning to be embedded in teaching, and identify any necessary adjustments. The guiding questions for this interview are set out in Appendix I.

Teacher participants were provided an overview of the interview topics to allow time for reflection (see Appendix F and I for interview questions). Each interview was audio-recorded, and notes were taken to help shape follow-up questions and summarise the main points. Transcripts were later shared with teacher participants for review, allowing them to edit or remove any responses as needed.

The interviews provided an opportunity for teacher participants to reflect on how existing practice arrangements supported PLD in sustainability education and local curriculum design. Additionally, the second interview sought to understand teacher participants' decision-making processes in curriculum planning, particularly how they integrated existing sustainability resources with the New Zealand Curriculum (MoE, 2007), their teaching practice, and sustainability pedagogy.

Focus Groups

Focus groups, as a qualitative data collection method, facilitate exploratory discussions that challenge views, opinions, and experiences while digging more deeply into teacher participants' shared thinking about the research topic (Gibbs, 2017; Menter et. al, 2011). Focus grpoups are organised interactive group discussions that promote the co-construction of knowledge, reshape perspectives, and empower teacher participants (Gibbs, 2017; Hopkins, 2007). In this study, focus groups involved school leaders, teacher participants, and me as the facilitator across all three CPAR phases. A total of five focus group sessions were conducted:

- Two in CPAR Phase One (FG1, FG2)
- Two in CPAR Phase Two (FG3, FG4)
- One in CPAR Phase Three (FG5)

The first focus group (FG1) in CPAR Phase One - Cycle One aimed to:

1. Understand the school's existing professional learning and development (PLD) structure.
2. Provide teacher participants with an opportunity to reflect on their PLD experiences, including what they value in PLD and what makes it effective.
3. Identify the practice architectures within the school that either enable or constrain sustainability education.

4. Collaborate on potential changes to practice arrangements that could better support PLD for sustainability education.

The guiding questions for this focus group can be found in Appendix G. The second focus group (FG2) was used to analyse and reflect on the data generated from the individual interviews and discussions in FG1. Insights from these sessions informed the design of the PLD sessions implemented in CPAR Phase Two.

Focus groups three and four (FG3, FG4) were used to evaluate the PLD sessions and explore how practice arrangements in the school supported sustainability education and local curriculum design. FG3 took place after five PLD sessions at the end of Term Three and FG4 was conducted at the end of Term 4, after seven SELCD PLD sessions were completed.

The final focus group (FG5), conducted at the end of PAR Phase Three, reinforced participation and collaboration by providing a structured space for teacher participants to evaluate their term's sustainability planning and curriculum implementation. Teacher participants reflected on their experiences of planning and teaching sustainability within the local curriculum, discussed strengths, challenges, and areas for improvement, and collaboratively proposed a way forward for sustainability education and local curriculum development. Appendix G sets out the guiding questions for this focus group.

During this final group meeting, teacher participants considered how site conditions could be adjusted to further support sustainability education. Together, we collaboratively planned the next steps in the school's sustainability education journey. As the school principal was unable to attend the final focus group discussion, the deputy principal shared the FG5 data with him.

All focus group discussions were recorded and transcribed by a professional transcriber who signed a confidentiality agreement (see Appendix E).

Data Analysis Methods

Two methods were used to analyse the data: practice architectures analysis and reflexive thematic analysis. The goal was to identify patterns and emerging themes, explore key issues, and interpret, summarise, and describe the data (Cohen et al., 2011; Creswell, 2014). These methods were chosen to provide both a structural and thematic lens for understanding sustainability education in local curriculum design. Practice architectures analysis was applied to the focus group data and focused on examining how professional development could be reimagined as the development of sustainability education practices within the school (Kemmis et al., 2014b). A key aspect of this analysis was evaluating how professional learning occurred in the case study school site and how it contributed to the embedding sustainability education practices within the school. Reflexive thematic analysis was applied to reveal patterns of shared meaning through thoughtful engagement with the interview data and the analytic process (Braun et al., 2019). While both approaches to analysis differ,

their combined use provided a richer, more comprehensive understanding of pedagogy as social practice as described by Kemmis and Grootenboer (2008).

Practice Architectures Analysis

This research aimed to understand how sustainability education practices are enabled or constrained by existing practice arrangements within the case study school. Practice architecture analysis was applied to the focus group data in two ways. First, it examined the relationship between sustainability education practices and the school site conditions as defined by Kemmis et al. (2014b): cultural-discursive (language and ideas), material-economic (physical space and time), and social-political (relationships and power structures). Second, it assessed how these site conditions impacted teacher professional development for sustainability education. This approach conceptualises professional learning not as the development of individual teachers, but as the development of sustainability practices within the school (Kemmis et al., 2014b).

To analyse the five focus group transcripts, the practice architectures framework was applied manually. Each transcript was examined three times, with each iteration focusing on a different element of practice: sayings, doings, and relatings, and the corresponding practice architectures: cultural-discursive, material-economic, social-political. The first round of analysis focused on the sayings, examining teacher participants' language, ideas, and understandings of the focus group discussion topic, as outlined in Table 5. These were analysed through the lens of cultural-discursive arrangements, identifying how shared meanings and forms of understanding were constructed within professional learning discussions. Statements from the transcripts were extracted and organised under the headings: Practices, Intersubjective Space (where conversation and dialogue take place), and Practice Architectures as established by Kemmis et al. (2014b). A sample of the practice architectures analysis can be found in Appendix J.

Table 5

Focus Group Discussion Placement

Focus Group:	Focus Group Time:
FG1	Professional development in general, after Interview One
FG2	Data from Interview One and FG1
FG3	After five SELCD PLD sessions
FG4	After seven SELCD PLD sessions
FG5	After a term of teaching, the following year

The second round of analysis centred on ‘doings’, capturing teacher participants’ actions, professional learning experiences, and engagement with sustainability pedagogy. Here the focus was on the material-economic arrangements: spatial, structural, and resources-related conditions that influenced sustainability education. The final round examined ‘relatings’, exploring teacher participants’ values, emotions, and relationships through the social-political dimension of practice architectures, including roles, hierarchies, and power dynamics.

Following this three-stage analysis, common themes across all tables were mapped onto an additional table to illustrate the entanglement of practices (Kemmis, 2022). This analytical framework captured the sayings, doings, and relatings that emerged during the focus groups, may shape SELCD PLD. These tables revealed key features of sustainability education PLD and their associated practice architectures, supporting claims about:

- how sustainability is conceptualised in the school,
- how school site conditions enable SELCD PLD, and
- how professional learning shapes local curriculum and teaching practices.

The tables also highlighted how emerging practices might influence the school’s broader practice arrangements for sustainability education. These analyses are presented in Chapters Four, Five, and Six.

Additionally, a further table was also used to track changes in practices over time, illustrating how practices evolved in response to shifting conditions within the school (Kemmis, 2022). These tables identified learning within the sayings, doings, and relatings of sustainability education and SELCD PLD at different stages as illustrated in Table 6.

Table 6

Analysis of Practices at Different Times During the Research

Time:	Occurrence:
Time One (T1)	FG2, analysing data from FG1 (focused on PLD in general and Interview 1).
Time Two (T2)	FG3, after five SELCD PLD sessions.
Time Three (T3)	FG4, after seven SELCD PLD sessions.
Time Four (T4)	FG5, after one term of teaching.

These tables illustrate learning as a process of transformation, clearly showing changes over time in what Kemmis describes learning that occurs “as coming to practice differently” (2022, p. 163).

By applying this framework, the analysis provided insights into how sustainability education was both supported and constrained within the school context. Identifying the underlying practice architectures shaping sustainability education allowed for a clearer understanding of how professional learning and development could be adapted to embed sustainability practices into local curriculum design.

Reflexive Thematic Analysis

The second data analysis process used in this study was thematic analysis, a flexible method for identifying and interpreting patterns in qualitative data (Braun et al., 2019). Reflexive thematic analysis, as articulated by Braun and Clark (2019, 2025), positions the researcher as an active meaning-maker rather than a neutral technician. In this study the data was coded inductively, with codes developed directly from the transcripts through close, repeated reading. This reflexive, data-driven approach allowed for patterns to emerge organically instead of being shaped by a predetermined coding framework. A full list of codes is provided in Appendix K, and a sample of the coding and thematic development is included in Appendix L.

Theme development was iterative, interpretive, and inseparable from my own analytical judgements, consistent with Braun and Clarke’s (2019, 2025) conceptualisation of reflexive thematic analysis. Teacher participants’ responses to each interview question were first extracted from the transcripts and grouped in a spreadsheet. Manual coding involved clustering related ideas, which were then visually arranged on A1 sheets using coloured paper to support the identification of meaningful connections and evolving thematic patterns. Throughout this process, reflexivity played a central role, as I continually revisited earlier interpretations and examined how my assumptions shaped the construction of themes.

Thematic analysis was also applied to the data from the practice architectures analysis of focus groups, furthering insight into how sustainability education and PLD were experienced and understood by teacher participants. This aligned with Braun and Clarke’s (2017) view of thematic analysis as a way of understanding what teacher participants think, feel, and do in relation to a phenomenon.

An inductive, participant-led reading of the data was complemented by a theory-driven interpretation, creating what Xu and Zammit (2020) describe as a hybrid analytical approach. While initial coding foregrounded the meanings expressed by teacher participants, further analysis drew on sustainability education literature, pedagogical theory, and practice architectures to interpret these meanings within a broader conceptual frame. This combination enabled a rich, layered understanding of teacher participants’ experiences and revealed the underlying practice arrangements that shaped their engagement with sustainability education and local curriculum design.

Research Rigour

Academic rigour in this study was established through multiple strategies consistent with critical participatory action research (CPAR) and guided by the theory of practice architectures as the underlying framework. The SELCD research spanned 12 months and encompassed three CPAR phases, each comprising several iterative cycles that enabled sustained participant engagement in data collection, analysis, and intervention within the SELCD PLD. Data were gathered through two individual interviews with participants (at the beginning of the research and the end of the SELD PLD) and five focus group sessions. Teacher participants verified their interview transcripts for accuracy, and summaries of responses were discussed with the research facilitator.

Credibility was strengthened through extended engagement with the case study school (three CPAR phases over 12 months) and triangulation of data sources (interviews and focus groups). Dependability was supported by comprehensive documentation systems through documentation systems that created a clear audit trail of decisions and next steps. Confirmability was enhanced through researcher reflexivity, acknowledging my role as researcher and colleague. Authenticity, central to CPAR, was evident in participants' active involvement in planning, reflection, and decision-making across all three phases, resulting in reported growth in understanding of sustainability education and increased agency in curriculum design. Finally, transferability was facilitated by detailed descriptions of the school's context, participants, and PLD processes, enabling school leaders and teachers to judge the applicability in their own settings.

Reflections on Research Design

The design of this research was informed by the literature reviewed in Chapter Two. The theoretical and empirical studies that were explored during the early stages of the thesis helped influence and guide the selection of critical participatory action research (CPAR) as a methodological approach and identify the theory of practice architectures as an appropriate analytical lens. The rationale for exploring sustainability through collaborative, context-sensitive, and critically engaged professional learning and development methods was established from foundational literature and as a response to the changes in educational policy and ongoing changes to the national curriculum.

While a number of sources cited in the literature review do reappear in the discussion chapters, this is not a repetition but a deliberate revisiting as they continued to offer relevance as the research evolved. Some literature served a more foundational role, helping to contextualise the research question and inform the early design stages but became less prominent in later chapters. This reflects a natural progression from theoretical framing to data-informed analysis, where additional literature was introduced in response to emergent findings. Overall, the literature was used strategically throughout the thesis to support both the development of the research process and the interpretation of findings.

Methodological limitations

While the research design was constructed to align with the aims of the study and was grounded in relevant literature, it is important to acknowledge the methodological limitations that shaped the scope and outcomes of the research. These limitations relate to case study and their lack of generalisability, researcher influence and bias, and the constraints of a single-site case study.

One of the primary limitations of case study research is the lack of generalisability, meaning that findings may have limited applicability beyond the specific context studied. However, because this research focuses on the practice architectures arrangements that enable and constrain sustainability education and professional learning for teacher participants, the findings may still offer valuable insights. Schools in other contexts may be encouraged to examine their own practice architectures to identify factors that influence teacher professional learning and development, particularly in sustainability education.

Another limitation of case study research is the potential for researcher influence and bias. To mitigate this, data were triangulated through multiple sources, including semi-structured interviews, five focus groups conducted over seven critical participatory action research (CPAR) cycles across the three research phases, and insights from the professional learning and development (PLD) sessions themselves. These sources provided complementary perspectives on teachers' evolving understandings and practices. In addition, findings were verified through participant review, with teacher participants invited to check transcripts and comment on emergent interpretations to ensure authenticity, accuracy, and shared ownership of meaning. The results were then analysed in alignment with sustainability education theory and presented both theoretically and through the lived experiences of practitioners. As Menter et al. (2011) and Konecki (2019) observe, a key strength of qualitative research lies in its flexibility, which fosters creativity and deeper insight, revealing nuances that might not be apparent in quantitative approaches.

As discussed earlier in this chapter, a single-site case study was chosen over a multi-site study to allow a more in-depth exploration of the practice architectures shaping sustainability education in the case study school. Gustafsson (2017) describes case studies as intensive investigations of a particular group, using multiple sources of in-depth data collection to explore real-world contexts. This depth of analysis enables the researcher to question existing theoretical relationships while also uncovering new insights into sustainability education and its integration into teacher professional learning and local curriculum design.

Chapter Four

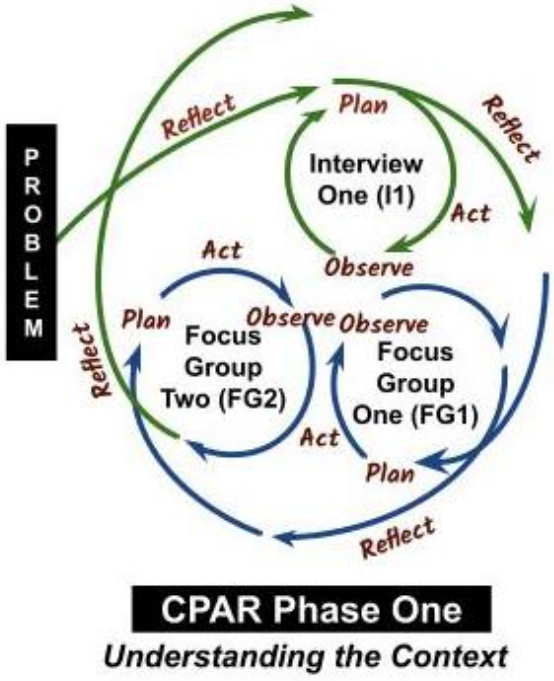
Understanding the Context for Sustainability Education PLD (Phase 1 Findings)

This study sought to understand how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design. In the preceding chapter, a detailed account was presented on the methodological framework of critical participatory action research (CPAR), aimed at engaging primary school teachers in the co-construction of knowledge and decision-making processes related to professional learning in sustainability education and local curriculum design (SELCD).

In this chapter a contextual understanding for the professional learning and development (PLD) is evaluated, demonstrating alignment with the overarching research aim and research question for this phase of the research. Accordingly, the aim of understanding the context guided this first reconnaissance phase of the CPAR framework. It involved assessing how sustainability education is conceptualised within the case study school through individual interviews and two focus group sessions. The data from each collection method has been analysed and reported on separately throughout the research findings chapters as each set of data builds on the prior data set in this critical participatory action research. The ensuing analysis of the first round of data collection, individual interviews and focus groups (see Figure 2), not only supports and elaborates the rationale but also shapes the content of subsequent SELCD PLD which is the focus of the second CPAR phase in the following chapter.

Figure 2

CPAR Phase One: Understanding the Context and Expectations



Understanding Characteristics of Sustainability Education

Individual interviews

The first PAR research cycle in Phase One began with interviewing each of the eight teacher participants to identify their understanding of sustainability and sustainability education. Thematic analysis of this first round of individual interviews generated four broad themes describing how sustainability education is conceptualised in the case study school, namely 'decoding sustainability', 'fostering community engagement', 'Enviroschools influence', and 'entangled learning and teaching practices.' Each of these themes provide the structure for this chapter.

Theme 1: Decoding Sustainability: Unravelling Conceptual Complexity

The initial set of interview questions (see Appendix F) aimed to uncover teacher participants' understanding of sustainability and sustainability education. The interview responses revealed a predominantly narrow comprehension, with most teacher participants characterising sustainability as something ongoing or enduring, and a few linking it to environmental concerns. Six of the eight teacher participants identified sustainability in this way. Mr T's response encapsulated this view, explaining: "I thought it was about environmental sustainability, so I know a lot about that. To be sustainable would be in a situation that looks after itself… whatever the outputs are, they go back into it as the inputs." Mr T's cyclical description captures how participants conceptualised sustainability, emphasising ecological balance and self-sustaining processes rather than a broader understanding that also encompasses social and economic dimensions. Seven of the eight teacher participants indicated at some point during the interview that they were unsure of what sustainability meant or what they needed to explore through the professional learning. Rangi's response summarised the group's sentiment: "I honestly don't know. It'll be right from the start… I am about to pick up my phone and Google sustainability." While teacher participants initially expressed limited and often uncertain understandings of sustainability, these uncertainties became a catalyst for learning.

A more holistic understanding of sustainability and its interconnecting aspects: economic, environmental, social, and cultural was not present in the interview responses. While there was a shared recognition of the importance of sustainability for life-long learning, uncertainties regarding what and how to teach sustainability were evident. The data did not yield clear teaching strategies and approaches. However, one participant (Alicia) alluded to the notion of relevance, where classroom learning is applied in everyday life, imbuing it with meaning and context, "So what they are learning in class they are actually taking and using it in everyday life… so the learning has meaning to it, it has context to it and it's relevant to them and their life." Alicia's emphasis on meaningful and contextualise learning suggests that an emerging awareness of sustainability as something that extends beyond environmental practice to include lived relevance for learners. Teacher participants identified local issues relating to environmental, social, and cultural concerns.

Six of the eight teacher participants named local environmental issues while three teacher participants highlighted cultural issues and three recognised social issues. Alicia and Beyoncé's responses illustrate these perspectives:

> Our river is a local issue - the state of our river and things like that and how to look after our river and keep it as clean as possible. Food wastage is a big one in our school, especially with free lunches and a lot of that, exploring and looking at ways to do that better. I think those two are definitely very suitable for our kura. (Alicia)

> The river. There is also the [local mountain range] because they all say XXX mountain but they don't know much about the [mountain range]. I need to explore [town name] myself because I don't even know much about it and I have been teaching here for five years, but I don't live here. I live in XXX but I'd never even been to XXX before I started working here. (Beyoncé)

These reflections demonstrate teachers' awareness of local environmental and cultural contexts but indicate a gap between recognising local issues and framing them within sustainability education.

Teaching topics were consistently tied to the school's engagement with Enviroschools and the resources provided through the Enviroschools programme. Teacher participants identified teaching themes such as 'Me and My Environment,' connecting them to sustainability. However, teacher participants' understandings and identification of sustainability-related learning appeared to stem from the Enviroschools Kaupapa[8]. Although local issues were recognised, links between these issues and sustainability education were not made explicit.

The primary school teaching team demonstrated a limited understanding and incorporation of sustainability in their teaching, as no one explicitly mentioned sustainability-focused themes or integration beyond surface-level connections. In contrast, the technology teachers identified themes aligns with their subject specialties and curriculum areas. They reported greater integration of environmental sustainability topics, discussing themes such as plastic waste, gardening, composting, worm farms, carbon footprint, and biotechnology. They also incorporated an economic dimension through the exploration of consumerism.

Analysis across interview questions indicated seven out of the eight teacher participants acknowledged the need to unpack the concept of sustainability, its relevance to education, and effective teaching methods. Beyoncé's response highlighted both her uncertainty and her interest in gaining knowledge about what sustainability entails and how it might be meaningfully integrated into

[8] A Kaupapa is an underlying philosophy, an agreed set of values, principles, and plans that form the basis of action.

teaching. When asked how she could be better supported to passionately engage with sustainability education in local curriculum design she stated: “Actually knowing what it is because I’m not really 100% sure, so more knowledge about actually what is sustainability in education”. Alicia emphasised the necessity of revisiting the basics of sustainability when identifying areas to explore during professional learning and development (PLD). Rangi’s response encapsulated the view of the group, expressing uncertainty and a willingness to start from scratch, as reflected in her inclination to begin by searching online for the term ‘sustainability’.

Collectively, these responses highlight the pressing need for teachers to decode sustainability, unravel its conceptual complexity, and bridge the gap between narrow and holistic understandings. Teacher participants’ uncertainties and desire for further knowledge positioned the development of a shared conceptual foundation as a critical first step toward effective sustainability education and local curriculum design. This recognition informed the planning of the SELCD PLD, which began with establishing a common understanding of sustainability before extending into aspirations for community connection and involvement, which is explored in the next them.

Theme 2: Fostering Community Engagement: Teacher Aspirations

A strong emphasis on community connection emerged as a central theme in discussions about the development of SELCD PLD. Teacher participants highlighted the importance of community input; collaboration with local iwi and the marae; understanding the local issues; setting learning priorities; exploring local history; and developing a localised curriculum. Mariah encapsulated this openness to new learning, stating, “I feel like ever since we got our new principal everything is just being built from the ground, so I’m pretty open to try anything - anything that makes the kura (school) grow.” Ana also reflected on learning priorities for the school expressing a desire for “going out and seeing what’s there in the community and bringing it back to see what we can add on or improve. It has to be inclusive - parents, teachers, students…Sometimes, they (community) can be the facilitators themselves.” Together, Mariah and Ana’s reflections illustrate teachers’ aspirations to strengthen partnerships with the community as a foundation for curriculum development. Their comments highlight a collective willingness to engage in reciprocal relationships where learning is co-constructed with, rather than for, the community.

The teacher participants expressed their desire to strengthen social cohesion through participatory decision-making and leveraging local resources to advance SELCD. Recognising the importance of involvement and collaboration with local iwi, aspirations to engage meaningfully with the community were evident, though uncertainty remained about how to establish these connections was expressed. Despite the principal’s multiple attempts to meet with community leaders, these efforts were often thwarted, with meetings being cancelled or unattended without explanation.

Covid-19 emerged as a significant barrier, disrupting the school's attendance at local events and its engagement in community initiatives. It heightened the challenges of building authentic community connections. Rangi described the difficultly of engaging in local issues noting, "It's a little bit easy but also tough because during the previous couple of years we haven't been able to even think about this (SELCD) because we haven't been able to engage." She also highlighted the geographical significance of their location, linking it to the river and surrounding landmarks of cultural importance. Cardi pointed out the impact on attendance and whānau (family) engagement, attributing it to divisions in the community. Expressing concern, she stated: "There's an 'us' and there's a 'them' and that's what I've seen… that separation which leads into the deeper side of things." Mariah echoed concerns, describing the challenges faced by the local marae (a traditional Māori meeting ground or community centre) as pandemic restrictions prevented gatherings and led to the cancellation of significant events.

Overall, the results emphasised a strong desire among teacher participants for deeper connections with their local community and recognition of the vital role of iwi in planning a localised curriculum. Despite the obstacles encountered, teacher participants' demonstrated a commitment to fostering community engagement and collaboration as foundational to advancing SELCD. While teachers aspired to stronger community partnerships, their current understanding of and practice of sustainability were guided heavily by professional learning experienced, particularly the Enviroschools programme, the focus of the next theme.

Theme 3: Influence of Enviroschools Professional Learning and Development

Another theme emerging from the interviews revealed that teacher participants attributed much of their understanding of sustainability education, including planning processes, resource utilisation, and teaching content, to their previous experiences with Enviroschools PLD. Their responses to the question, 'Can you tell me about your understanding of sustainability?' demonstrated alignment with both the Enviroschools Kaupapa (vision & purpose) and its guiding principles (Enviroschools, n.d.). These responses fell into two distinct categories: sustainability as an ongoing commitment, and sustainability as linked to the environment.

When asked about their planning practices, three teacher participants explicitly stated that their themes, topics, ideas, and activities were directly influenced by Enviroschools and the resource kit provided by the organisation. Rangi emphasised the impact of Enviroschools PLD on planning, stating: "Last term was dictated by the Enviroschools PLD we had, so we looked at *Me and My Environment*, which leads to this." Beyoncé echoed this sentiment, describing how she integrated Enviroschools material into learning activities that connected students with their environment and local community:

> We get our planning off Enviroschools. It's good because it's got the theme areas and activities, we can just change to suit us. One of them was going out to collect leaves and make art with sticks and natural resources. We did mapping our place - we drew a map of [town name], naming the marae, the waka, the awa. Then we talked about special places at school and what the kids would like to add or change - they wanted a tree house, more like places to sit and play. (Beyoncé)

Beyoncé's example demonstrates how Enviroschools PLD provided a ready framework for curriculum design and experiential learning. Her focus on local geography, cultural landmarks, and creative environmental activities reflects how the programme helped the teachers translate sustainability principles into tangible classroom practice. Other responses to this question varied, four teacher participants described their planning as flexible and open, while five explained that their planning was student-centred. Beyond the Enviroschools topics, resources, and PLD, no specific routines or planning practices were mentioned. Instead, content and resources were drawn from a range of online sources and external contributors.

Cardi detailed her use of Enviroschools worksheets and the collaborative planning process among staff. She highlighted the flexibility of choosing topics from a planning document and the richness of resources available, explaining that she decided how to utilise the resources with her class. Describing her classroom practice, Cardi reflected:

> "We did lots of walking around. We'd see it on paper then go and touch it – walk around the school to feel it. There were lots of conversations, not so much writing all the time. We talked with whānau about pepeha (traditional Māori introduction where connections to people and places that are important to you are shared) to make sure the children understood their connections, and if they didn't know we'd find ways to help them." (Cardi)

Ana mentioned that the school's Enviroschool status influenced topics taught in relation to sustainability. She described the facilitator's big folder as a valuable resource, that provided access to a wide range of teaching materials and ideas. Reflecting on how these resources translated into classroom practice, Ana explained: "Our facilitator has a big folder where we can get resources from. The students can always relate to our own practices in the school - recycling rubbish, maintaining the worm farm, collecting food scraps and taking them to the worm farm." Ana's reflection illustrates how Enviroschools PLD fostered both practical environmental action and culturally grounded learning, connecting classroom activities to wider community practices. She also recalled that about five years ago the school had been recognised as a bronze and then silver school in the Enviroschools programme, noting the impact of staff and leadership changes: "It had a huge impact on everyone. We have to start from ground zero again because of the change of staffing, principal, leadership team, students and their thinking may be different." This comment highlights the challenge

of sustaining collective understanding and momentum in sustainability initiatives amid organisational change. The Enviroschools status Anna referred to is one of three stages or qualifications within the Enviroschool programme, bronze, silver, and green-gold, each building on the previous and reflecting a deepening and broadening of the Enviroschools journey, its guiding principles, and whole-school approach.

Mr. T, noted the school's Enviroschools silver status, acknowledging the initial momentum that slowed down over the years but emphasising a renewed focus on environmental sustainability, interest in the local area, and the development of a local curriculum. As he explained, "We've got a silver at the moment which we earned a few years ago, and it kind of fell off, so we're picking it back up again to work towards that green-gold." He further described ongoing efforts to connect learning with local places and community, referring to "the iwi and marae across the river, and the river itself."

Participant responses varied based on their length of teaching service in the case study school. Teacher participants with more experience who had accessed the Enviroschools PLD demonstrated greater insights into planning and sustainability understanding, while newer teacher participants mentioned using Enivroschools resources but provided fewer detailed examples. Rangi, for example, who had nine years of teaching experience in the school, discussed how planning linked to environmental themes, cultural celebrations, and connection to the local area. She understood the concept of whakapapa (Māori genealogy) and connection to the land and all living things. Cardi, in her first year of teaching, described the team planning process, the term's teaching theme, and the use of Enviroschools resources, noting that they were helpful in structuring lessons linked to the theme.

The data revealed that while Enviroschools provided a valuable foundation for content knowledge and experiential learning, teacher participants faced challenges in extending their learning beyond the structured programme. Many relied heavily on Enviroschools-provided resources and frameworks rather than independently researching or integrating sustainability education into everyday teaching practices. This reliance was particularly evident among newer teacher participants, who referenced using Enviroschools materials but offered fewer examples of independent application. Consequently, the embedding of sustainability education within the school remained a work in progress, with the depth of integration varying according to teacher participants' experience, confidence, and access to ongoing professional learning. Nevertheless, these findings suggest a growing awareness and willingness among teachers to move toward more autonomous and locally responsive approaches to sustainability education.

Theme 4: Entangled Learning and Teaching Practices

The data revealed connections between teaching practices and the school's overall practice arrangements. These practice arrangements, shaped by institutional structures, professional

learning opportunities, and available resources, both enabled and constrained teacher participants' pedagogical decisions, demonstrating the entanglement of practices within the school environment. This entanglement was evident in how teacher participants perceived PLD as an avenue for new learning and a way to build on existing knowledge while also seeking guidance, knowledge, and resources from diverse sources, including experienced teachers, colleagues, websites, social media, and whānau (family). Seamus, an experienced teacher, highlighted the usefulness of past PLD sessions, especially during the rollout of the new curriculum, and how it contributed to his and Ana's understanding of delivery methods and curriculum breadth. He explained:

> We've done PD in the past – especially when the new curriculum (2007) came out, there was a big push. That was really helpful; it made us understand how to deliver it and what we were looking for. My biotechnology curriculum was brand new when I started, so I developed it going to PDs, talking with other biotechnology teachers, and learning through the Royal New Zealand Society, where I did large-scale worm farming and a study award in Māori rongoā.

His reflection illustrates the entanglement of institutional and individual learning, where PLD acted as both a catalyst for curriculum development and a springboard for ongoing professional learning.

Rangi provided insight into the school's planning journey, emphasising the interconnectedness of planning, teaching content, PLD, timetabling, and student outcomes. As she explained:

> In planning, we aim to have one integrated unit or key Kaupapa where one curriculum area is at the forefront: science, social sciences, or Te Ao Māori. This year we've been going term by term, often guided by Enviroschools PLD or dictated by curriculum coverage and the basics, literacy and numeracy. Lockdowns over the past two years meant we had to keep adapting our plans. Our planning is collaborative; we sit together, share ideas, and use resources from PLD, colleagues, and online teacher networks. We might design elaborate plans, but sometimes the learning takes a different path, depending on what the students bring or how the term unfolds. We can do really elaborate plans and have amazing ideas and then look back at the end of the term and, opps, whoops, we did something a bit different.

Rangi's account exemplifies the entangled nature of planning practices, where external factors, institutional organisation, and teacher and student agency interact fluidly. She acknowledged the challenge of aligning the final product with the intended outcome. Her description demonstrates how PLD, contextual influences, and decision-making influence the dynamic nature of curriculum design and planning processes.

Guided by the senior leadership team, the school staff actively incorporate Enviroschools PLD, themes and resources into their planning for each school term. Additionally, school leaders participate in regional PLD sessions on localised curriculum, and collaborative meetings with Kāhui Ako[9] leaders to work towards developing a local curriculum. When asked, 'How do you plan for sustainability education?', a consensus seemed elusive in this first CPAR phase. More experienced teacher participants anticipated thorough curriculum coverage and detailed their involvement in integrated units of work guided by a clear Kaupapa or theme and a curriculum learning area. Despite variations in responses about planning, a consensus emerged with 'off-the-cuff' or 'in-the-moment' planning, which allows for flexibility, valuing spontaneity, and adaptability. Alicia explained that their junior hub planning was intentionally open, with broad concepts and in-the-moment adjustments based on students' interests guiding practice: "We'll have a concept that we want to teach, but often on the day there's some interest or different kōrero (discussion) from the kids and we pull from that." Similarly, Mr. T emphasised his preference for adaptability explaining, "I'm not a big fan of having a strict plan. I'll have an idea in mind that'll come from the kids." Both Alicia and Mr T's reflections highlight a student-led orientation, valuing spontaneity, and the ability to adapt plans based on student' responses. They both described their approach as starting with a general outline and then allowing students' interests to guide the direction of learning.

The integration of teaching practices with PLD, planning, and the broader school practices and arrangements is a complex and interconnected process, as articulated in teacher participants' narratives. In essence, the individual interviews highlighted a collective aspiration among teacher participants for a unified understanding of sustainability and sustainability education within the unique context of their school. Notably, there was a strong inclination toward fostering community engagement, particularly through meaningful connections with the local iwi.

Despite the challenges posed by the disruptive influence of Covid-19 on community partnerships and its impacts on planning, learning, and teaching, teacher participants remain resolute in their optimism for navigating a way forward. The Enviroschools programme and PLD emerged as influential factors shaping teacher participants' perspectives and teaching methods, specifically in the realm of environmental sustainability. The data suggests that while Enviroschools resources serve as valuable aids for planning, teaching, and learning, multiple teacher participants primarily referenced these materials when discussing their sustainability education planning. This reliance on external materials may indicate a tendency to default to provided templates rather than engaging in deeper inquiry of developing context-specific approaches.

[9] Kāhui Ako, also referred to as 'Communities of Learning', are groups of schools and education providers that work together to help with student achievement, tackling the challenges and utilising each other's skills, knowledge, and experience. There are 220 Kāhui Ako around Aotearoa New Zealand (MoE, 2025).

The introduction of PLD into the school environment significantly shaped teaching and learning dynamics, with the potential to either enable, constrain, or minimally influence teacher participants' ideas, thinking, practices, and relationships. The unanimous recognition among teacher participants regarding the importance of open and flexible planning highlighted the critical importance of a more personalised and adaptable approach to planning. Acknowledging this necessity led to the realisation that a one-size-fits-all strategy did not adequately cater to the diverse needs and preferences of teacher participants. Instead, the need for a more responsive pedagogical framework emerged.

Summary of Interview One Themes

In working to understand the context, uncovering the characteristics of sustainability that were evident in the school was the first step. The themes that emerged from the first round of individual interviews revealed that while there was and understanding of sustainability, this required further exploration and collective unpacking, particularly in relation to sustainability in education. The conceptual complexity needed to be unravelled collaboratively to reach a shared understanding. Teacher participants expressed strong aspirations for community engagement and recognised the value of learning in and with the community but needed support to initiate these partnerships. In terms of professional learning, Enviroschools PLD and its accompanying resources were identified as central to supporting planning and teaching. However, outside the Enviroschools framework, teachers were uncertain about what and how to teach sustainability. The findings also revealed clear connections between individual teaching practices and the school's broader practice arrangements, evident in the participants' experiences of PLD and their integration of learning into practice.

Experiences of Professional Learning and Development (PLD)

Focus Group One

Complementing the individual interviews on sustainability and sustainability education, teacher participants' perspectives on their professional learning and development experiences were explored in a focus group discussion. In this segment of the Phase One findings of the critical participatory action research (CPAR), I examine the insights derived from Focus Group One (FG1), consisting of the primary teaching team, technology teaching team, and the senior leadership team. A summary of the data derived from this focus group and the individual interviews was taken to Focus Group Two (FG2) so that the teacher participants could make sense of the data and suggest a way forward with the SELCD PLD (see Appendix M).

Focus group discussions were analysed using the Practices and Practice Architectures framework (Kemmis, 2022; Kemmis et al., 2014b) to examine how PLD shaped teacher participants' "sayings, doings, and relatings" and how these were influenced by discourses, material and economic conditions, and relationships within the school (Kemmis, 2022, p. 123). This analysis informed the

conditions and arrangements required to facilitate SELCD PLD and identified factors that either enabled or constrained action and interaction. Participant responses were examined across three themes: forms of understanding, modes of action and ways of relating to each other and the world. Table 7 summarises the findings from Focus Group One (FG1) using Kemmis' (2022) table of invention.

Table 7

FG1: Synopsis of PLD in General 26/5/22

Analysing the Entanglement Between One Practice and Another

The sayings, doings, and relatings of school professional learning and development sessions became the practice architectures that shape the sayings, doings, and relatings, of professional learning in SELCD PLD.	
Sayings *Forms of understanding*	*Thinking and talking about school PLD become the Cultural-Discursive arrangement that shape the thinking and talking of SELCD PLD.* • PLD is viewed as an opportunity for growth. • New understanding is built through PLD and ideas being developed. • PLD provides opportunities to try out new things and build confidence. • PLD must be relevant and practical for the classroom.
Doings *Modes of action*	*Activities, work, and material arrangements become the material-economic arrangements that shape activity, work, and material arrangements of SELCD PLD.* • Time is required to implement new learning (time consuming). • PLD must be practical, hands-on, align with school goals, and be participatory. • Time of day is a consideration, "afternoon - brain is blah". • PLD needs to be frequent for it to take effect.
Relatings *Ways of relating to each other and the world*	*Relationships of power and solidarity become the Socio-Political arrangements that shape relationships, solidarity, and power in SELCD PLD.* • Whole school PLD and learning together connects staff. • When all teachers participate in PLD together there are things to talk about. • Experiencing PLD together makes it more valuable/ PLD is enhanced when done together. • PLD must be relevant and link to the people they are working with. • New ideas are implemented from PLD sessions.

Sayings: Forms of Understanding

The teacher participants' *sayings*, reflecting their thoughts and understanding of Professional Learning and Development (PLD), emphasised the impact of both internal and external providers. The school already featured a diverse range of PLD, including digital technology, Te Reo Māori classes, a three-year mathematics PLD focus with Developing Mathematical Inquiry Communities (DMIC), Positive Behaviour for Learning (PB4L), Enviroschools, leadership, school visits, and marae

visits. While most of the PLD was facilitated by external providers, some in-school coaching, observations and feedback occurred with school leaders.

The overall sentiment from teacher participants, encapsulated by Rangi, indicated that PLD opportunities were typically communicated to them, via the senior leadership team, Ministry of Education, or the Student Achievement Facilitator (SAF), and there was, “tons of it”. Mr. T noted a significant increase in PLD frequency since the arrival of a new principal, describing it as abundant and beneficial. Despite the abundance of PLD, teacher participants viewed it as an opportunity for personal growth, as expressed by Cardi: “I’ve had lots of PLD because it is opportunities for me to grow and it’s cool… things that I am really passionate about – that’s what I really enjoy and drive to excel at, Te Reo Māori.” Moreover, teacher participants recognised that shifts in thinking were linked to the development of new understandings around PLD topics. This was evident in teacher participants expressing positive views about student behaviour after PB4L PLD and recognising PLD as a platform for trying new approaches and building teacher confidence.

Emphasising the importance of relevant PLD, teacher participants unanimously prioritised ‘relevance’ as the most crucial factor, with Alicia stating, “If you are talking about things that you can’t link to what you’re doing at that time, it’s kind of meaningless.” When asked about key aspects of engaging PLD, responses consistently highlighted the importance of it being interactive, hands-on, and relevant. Additionally, one participant stressed the significance of understanding the ‘why’ behind the PLD, citing sporadic sessions as hindering implementation and impact on the school. These participant reflections illustrate the strong connection between teaching practices and the cultural-discursive arrangements within school – structures shaped by language and ideas introduced or reinforced through PLD.

The impact of PLD became evident through noticeable shifts in thinking and communication regarding topics covered in PLD sessions. Mr. T provided an illustrative example linked to Mathematics PLD, highlighting significant changes in language usage: “With DMIC this year, I’ve focused on building their mathematical language. We’re using words like common multiples instead of times tables, and the kids really get it now.” Both teachers and students began using subject-specific (mathematics) and topic-specific language. In his example the incorporation of ‘common multiples’ notably contributed to enhancing students’ understanding. This shift in language use further illustrates how PLD introduces and reinforces cultural-discursive arrangements within the school, embedding specific language and ideas that shape, enable, and constrain teaching and learning practices over time.

Doings: Modes of Action

The teacher participants' *doings*, evident in their skills and capabilities, demonstrated an inextricable link to the material-economic arrangements present or brought to the school through spatial set-ups, such as classroom layouts, designated PLD spaces, resource availability, and timetabling that structured access to these spaces. Emphasising time as an important factor, teacher participants highlighted its significance in the organisation and allocation of PLD, stressing the frequency required for its effectiveness, and the time needed to implement new learning.

While teacher participants were generally positive about the SELCD PLD, concerns were also raised regarding the need for ongoing support to sustain momentum. Mr. T, for example, emphasised the importance of continuous engagement, urging that facilitators, "don't just come once and then go. Keep it coming until it's happening." His comment reflects the wider recognition among the teaching team that one-off initiatives were unlikely to produce lasting change without sustained, embedded support. This expectation was shaped by positive experiences with other professional learning, such as the school's mathematics PLD, where ongoing collaboration, alignment with classroom activities, and integration into planning had helped embed new practices over time. Similarly, Enviroschools provided consistent PLD to the school as part of their programme, with teachers acknowledging its influential impact on their sustainability planning.

However, despite recognising the value of ongoing professional learning, teacher participants were also cognisant of the practical challenges associated with maintaining focus amid competing demands. As Mr T observed, "some of those kaupapa are always all guns blazing at the start, but then you get swamped with all this other stuff, and it falls to the back because it's one of those things that takes time to do." His reflection highlights the tension between aspirational initiatives and the realities of workload pressures, illustrating how even well-intentioned programmes risk losing traction without adequate time and resourcing for implementation.

Teacher participants also highlighted the timing of PLD sessions as a crucial consideration. Sessions scheduled in the afternoon, immediately following a day of teaching, were the least preferred due to cognitive fatigue. Teacher participants felt less mentally alert and engaged at this time, compared to PLD held during teacher-only days, which allowed for more sustained and focused participation. Beyoncé's response encapsulated this concern when discussing how PLD could be improved, "I think too sometimes the time of the day when we have the PLD, if it's in the afternoon, sometimes my brain is like blah". Although afternoons were not ideal, PLD was also scheduled before school and during the school day through timetabled mathematics coaching sessions. Whole days dedicated to professional learning were generally preferred. This highlights the significance of the school's material-economic arrangements, such as timetabling, physical space, and resource allocation, in shaping the conditions that enable or constrain professional learning and development.

A prominent finding from the data was the importance of PLD being practical, hands-on, aligning with school goals, and being participatory. Alicia summarised effective PLD as, “Hands-on kind of learning where you’re participating in something rather than just listening to someone talk for hours, not a lecture, and have things to take away too, resources.” Mr. T echoed the importance of PLD being presented as effective practice, modelling best practices instead of just being explained. He believed that if a facilitator was advocating interactive student engagement, they should be modelling interaction in the PLD sessions.

Relatings: Ways of Relating to Each Other and the World

The teacher participants’ *relatings*, were evident in their values, feelings, and emotions, highlighting the social-political arrangements shaped by roles and relationships withing the school. The team valued collective learning as a means of fostering connection. Rangi described how PLD was strengthened when undertaken together: “I think PLD is enhanced when enough of us are doing it together.” Reflecting on the Incredible Years PLD she added, “It would have been so much more valuable if we’d all done it, because Beyoncé and I have the gems and take for granted that we’re using the strategies.” Her reflection highlights the perceived benefits of shared PLD experiences and the missed opportunities when professional learning is not equally shared among staff. However, this collective approach was not consistently implemented, despite the perceived relevance of particular PLD for the entire school.

Another example of relational growth was the opportunity for several staff members to learn Te Reo Māori. Participants explained that shared language learning created a common talking point and fostered spontaneous discussion. As Mr T explained, “With the Te Reo, it was optional, but a whole lot of us took it on, and now there’s always talk the next day about it.” Rangi and Alicia echoed this sense of connection, noting, “We have something in common…we’re all doing it - things to talk about.” Teacher participants unanimously agreed that learning together was beneficial, creating a sense of unity and collective momentum. In this way, the PLD space became a medium for solidarity, fostering an intersubjective space where colleagues encountered, encouraged, and supported one another through shared learning experiences.

When asked how they could support each other in the SELCD PLD, Alicia described the importance of being each other’s “cheerleader”, Luther saw importance in organising regular “check-ins with each other”. These along with other responses indicated support for dedicating time to discuss the new learning, share classroom experiences, and offer feedback following peer observations. Building on this collaborative ethos, Rangi suggested that teachers should be given dedicated time following PLD sessions to, “to nut out what they learnt” together, co-create resources, and consolidate their new learning through collective reflection.

Beyond internal collaboration, teacher participants also recognised the importance of linking their professional learning to the wider school community. They expressed a strong desire to venture out into local places of significance, forge stronger relationships with iwi, and involve local community members and whānau more actively in their teaching. Engaging these human resources was seen as integral to enhancing the authenticity and sustainability of their curriculum design journey.

Planning for Sustainability Education PLD

Focus Group Two

After conducting individual interviews, followed by the first focus group discussion (FG1), the second focus group (FG2) took place. This analysis aimed to inform the structure and content of PLD to enhance SELCD PLD. The significant findings from FG2 are outlined in Table 8.

Table 8

FG2: Synopsis of Data Analysis from Interview 1 and FG1 7/7/22

Analysing the Entanglement Between One Practice and Another

The sayings, doings, and relatings of teacher's evaluation of Interview 1 and Focus Group 1 summary showing their understanding of SE and PLD.	
Sayings *Forms of understanding*	*Thinking and talking about understanding of SE and PLD becomes the cultural-discursive arrangements that shape the thinking and talk in and about SELCD PLD.* • SE is about more than academics; it includes life skills. • There is not enough understanding of local issues, culture and connection to local marae or local area yet. • A common understanding of sustainability and sustainability education is needed and must be developed. • PLD must link to local area/ community.
Doings *Modes of action*	*Activities, work, and material arrangements of SE and PLD become the material-economic arrangements that shape activities and work, and material arrangements of SEPLD.* • PLD is about learning something then doing it. It must be hands-on. • Teachers need time to discuss things. • Continuous, regular PLD and whole days are preferable. Learning will be forgotten if PLD is spaced out. • Uncertain how to structure PLD. Can't make definite decisions as that is up to the principal (timing). • Consistent coaching/ observations and feedback are anticipated.
Relatings *Ways of relating to each other and the world*	*Relationships of power and solidarity in SE and PLD become the socio-political arrangements that shape relationships of power and solidarity in SELCD PLD.* • PLD as a team will strengthen the team. • PLD must include community and whānau.

The primary objective of this second focus group discussion was to enable teacher participants to collectively analyse the summarised responses from the interviews and FG1 to collaboratively establish a consensus on the future direction for the SELCD PLD. I sought insights from the team members on how they interpreted the gathered data, their preferences regarding crucial topics to be

included in the PLD content, their preferred structure for the PLD, and the identification of individuals to be involved in the PLD. The data collected from this second focus group was analysed using the same framework as for FG1.

Sayings: Forms of Understanding

In unpacking the data summaries, teacher participants' *sayings*, shed light on their priorities for enhancing understanding of SELCD through PLD. Rangi's initial comment set a positive tone, emphasising the alignment of perspectives within the group. She remarked, "We're all on the same wavelength," a sentiment echoed by Mr. T, who observed, "I think it relates very well to our current strategic plan in developing a local curriculum that focuses on whanaungatanga and that kind of stuff." Their comments highlight a shared sense of purpose and coherence between PLD focus areas and the school's broader strategic direction.

A consistent theme was the belief that sustainability education should support holistic student development and life skills, moving beyond a narrow emphasis on achievement within the foundation curriculum learning areas. Notably, the data revealed an absence of references to student data or assessment, with teacher participants instead drawing attention to aspects recognised as areas of weakness, particularly community involvement and engagement. When discussing the school's priorities, the teaching team collectively agreed on an unexpected shift in focus from conventional academic targets and assessment to fostering life skills. Mr. T reflected on this shift, observing that "Our learning priorities are quite interesting, there's nothing about maths, reading, or writing, it's more about life skills," and emphasised that success in sustainability education depends on addressing the holistic development of the student: "I get the vibe that we all have this idea that in order for us to be successful it's about the whole individual rather than just their academics."

While teacher participants recognised the need to develop understanding and engagement in specific areas, such as local issues, culture and connections to the local marae and community, they also emphasised the importance of involving whānau and the community in this journey. Luther raised questions about the extent of inclusion of Aotearoa New Zealand Histories in SELCD PLD, expressing curiosity about how this learning might connect to whānau (family) experiences: "It would be awesome to actually look back and see what went on here – it was so significant and important to the country as a whole." His comments resonated with the group, reinforcing the significance of local history for both the community and the wider national story. Mariah added, 'It's timely for us to look into the Aotearoa New Zealand histories and the significant places here (town name)", highlighting both her awareness of and curiosity about local landmarks. Luther and Mariah's reflections sparked enthusiastic discussion about how to weave local history, pūrākau (stories), and Māori achievement into the curriculum.

Rangi reiterated the importance of unpacking the concept of sustainability and sustainability education before engaging the wider community. She acknowledged: “A need would be for us to have an understanding, a full and common understanding of sustainability education.” This reflects the role of cultural-discursive arrangements in shaping shared meaning, where ‘full’ means a deep, comprehensive grasp of sustainability concepts, while ‘common’ refers to the collective language and discourse necessary for cohesive action. Rangi expressed this need for herself, stating, “I’m actually that one…I still have no idea what it means”. Establishing this shared understanding would be the foundational step for SELCD PLD.

Doings: Modes of Action

In the context of *doings*, encompassing the activities and the work involved in PLD, teacher participants’ perspectives were examined to delineate key material-economic arrangements for the SELCD PLD. The focus group discussion revealed that the teacherparticipants emphasised the importance of hands on, interactive learning experiences that equip teachers with practical skills for the classroom. They expressed a strong preference for discussing and exploring SELCD strategies, rather than passively receiving information. As Cardi explained, learning was more effective when it involved “hands-on practical and modelling, not telling,” describing herself as someone who needed to “see it being done - you tell me and it’s going back in the bag.” She added that this approach reflected the wider culture of the kura (school): “If we’re doing the task, then we connect better than be just telling you to write A to B.” Her reflection highlights how active, shared participation strengthened understanding, consistency, and connection among staff.

A recurring theme derived from the synthesis of individual interview summaries and focus group one was the structure and timing of PLD. The group expressed a desire for ongoing and regular PLD to sustain momentum and passion for learning. As Mr. T articulated, “I like being hammered with it”. Mariah preferred to “learn something, learn how to do it, then do it…because by the end of the doing part, it’s probably sunk in, so you’ll have more of an understanding when you teach it.” Their preference was for PLD not to be spaced too far apart, as they feared losing the acquired knowledge over time. Full days, utilising teacher-only days and callback days, were deemed preferable, providing the team with opportunities to visit local places and discuss new learning. Cardi summarised this collective sentiment, emphasising the needed for regularity: “…something that is consistent, otherwise it goes out of my head.” As part of this ongoing and regular PLD, the desired coaching format included modelling teaching, observing teaching, and giving feedback to individual teacher participants about their SELCD teaching.

However, the implementation of these material-economic arrangements hinged on timetabling, with the ultimate decision about the timing and structure of the PLD resting with the school principal, who unfortunately could not attend the focus group meeting. This highlights how material-economic arrangements are entangled with political arrangements, as the power to determine PLD structures

lay beyond the immediate teaching team. At the time of this focus discussion, the principal had already considered allocating Wednesday afternoons for PLD, but the complexity of scheduling PLD in an already busy school with a busy PLD schedule became apparent during the focus group discussion.

Thinking about PLD planning with regard to meeting the group's needs meant the PLD needed to incorporate the creation and use of resources and visits to various places. The group expressed a preference for digital and paper resources, as well as face to face rather than online PLD sessions. Rangi explained that while digital materials are useful for accessibility, "you can't beat having them in digital form because you are never going to lose them," she also valued tangible classroom materials, noting that "you kind of want that physical thing instead of just always putting it on the screen." Teacher participants sought concrete examples of what SELCD would look like across different school years, highlighting the need for tangible, actionable resources that could be used immediately in their classrooms. This demand for practical, hands-on resources aligns with the material-economic arrangements of PLD, both theoretical and directly applicable. As such, PLD planning needed to consider the creation of both digital and paper resources, as well as opportunities for face-to-face interaction to meet the group's desire for applied knowledge.

Relatings: Ways of Relating to Each Other and the World

In the realm of *relatings* within PLD, where teacher participants' values, feelings and emotions are shaped by social-political arrangements found in or brought to the school site, the focus group recognised the potential of collective PLD to strengthen the entire team. Employing critical participatory action research (CPAR) as a methodology aimed to foster a collaborative approach, moving away from traditional hierarchical power relations to promote inclusive decision making. This shift towards solidarity was key in creating a shared sense of responsibility and mutual support, where all voices were valued, contributing to the collective growth of the group.

The focus group discussions highlighted a preference for collective learning and a collaborative journey in SELCD PLD. Teacher participants expressed a shared desire for inclusive learning that would enhance teacher confidence and competence. Rangi emphasised the significance of mutual support, stating, "If we all experience something together, it makes everything more meaningful and powerful. All doing it together is the first step of everyone being able to support everyone". Anticipating the positive impact of this collective effort, she envisioned that PLD would "strengthen that team feeling and everybody's confidence in the extra skills and everything that they bring." Mr T added, "There's nothing worse than having to tell other people about the PLD." Together, Rangi and Mr T highlighted the importance of full staff participation in developing the school's vision for success in sustainability education and local curriculum design.

There was a sense of anticipation from the longer-serving teachers, particularly Rangi and Mr T, who had both been at the school for nine years. Rangi reflected on the significance of finally having the opportunity to shape the school's direction: "I've been waiting nine years for this. Everyone here is an asset to our kura (school) with so much to bring. For me, this is the first opportunity where I've ever been able to have a say." Her reflection conveys a deep sense of ownership and optimism for a genuinely collaborative process, envisioning a kura that, "works as a team, a really strong team." She added that the group, despite their different ideas, "all started from the same kōrero," capturing a shared foundation for growth. Echoing this, Mr T emphasised that achieving such a vision required a shared commitment, noting that everyone on the team needed to "see the value in the PLD."

Another consideration embraced by the group was the inclusion of the local community, whānau (family), and Tamariki (children) on this journey. Mr. T highlighted this as a previous weakness, acknowledging, "Our community involvement and engagement have been lacking. We know how many Māori kids we have, but I feel like I need to know more to actively engage with them properly." His reflection emphasised the group's recognition that strengthening relationships and understanding was essential for meaningful, culturally responsive engagement. The group suggested establishing a foundational understanding of sustainability, sustainability education, and local curriculum design as an initial step, paving the way for further collaboration with their community.

Summary of CPAR Phase One

Decision-making Process for Planning Sustainability Education PLD

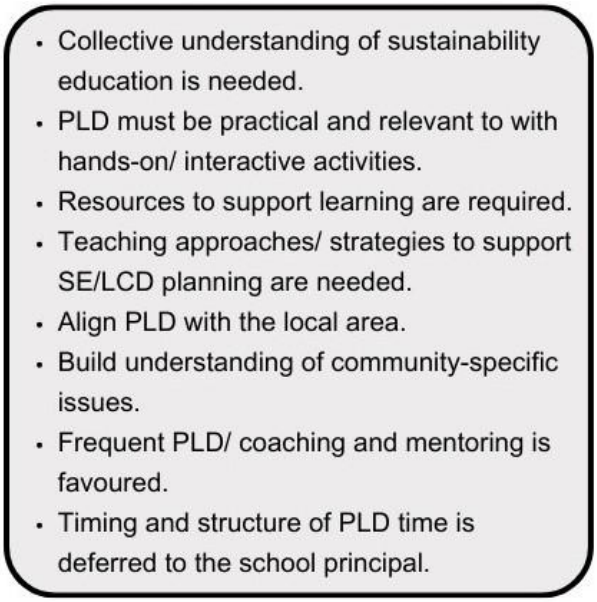
The data in this chapter delineates a clear pathway for SELCD PLD planning. Teacher participants outlined the content that needed inclusion in the PLD. Foremost among these was the necessity for a shared understanding of sustainability and sustainability education. Practicality and relevance for classroom implementation were deemed paramount, requiring teaching approaches and strategies that actively supported sustainability education planning. A vital aspect identified was the ability to locate pertinent and valuable resources independently, reducing dependence on external organisations. However, this desire for resource autonomy contrasts with recent government initiatives, which have increasingly promoted the use of government-prescribed resources, particularly for literacy and numeracy teaching. While these external resources aim to standardise teaching practices and ensure consistency, they could be seen as another form of external reliance, replacing one set of resources with another.

In contrast to this standardisation, teacher participants emphasised the importance of aligning learning with the local area and fostering an understanding of community-specific issues. These strategies were seen as key to advancing the school's community engagement goals. Frequent PLD sessions were advocated for efficiency, with a consensus against scheduling in the afternoon

following a day of teaching. While coaching and mentoring cycles were favoured, the final decision on the timing and structure of the PLD rested with the principal. Ultimately, SELCD PLD was envisioned as a collective effort, with whole-team participation. A phase diagram (Figure 2) was presented at the beginning of the chapter, thus illustrating the emergent nature of CPAR methodology and an overview of the data collection cycle, while Figure 3 is a summary of the findings from this phase of the research.

Figure 3:

CPAR Phase One: Summary of Findings



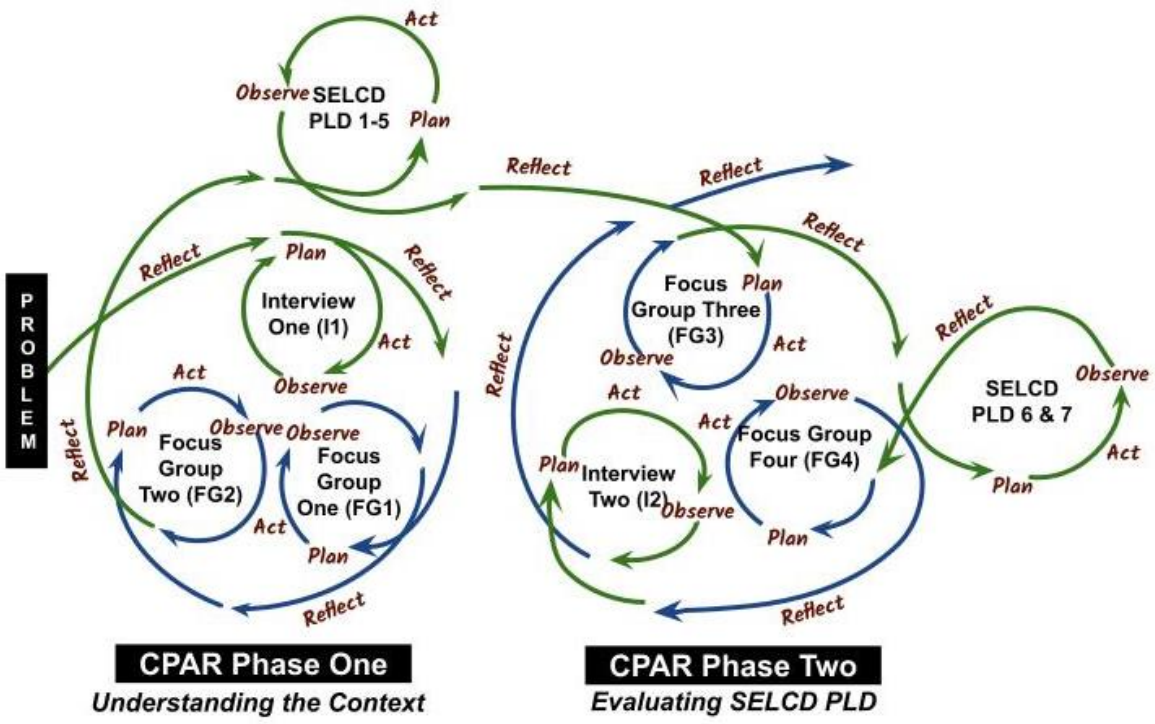
CHAPTER FIVE

Professional Learning Arrangements for Enabling Sustainability Education and Local Curriculum Design (Phase 2 Findings)

In the preceding chapter, emphasis was placed on understanding how sustainability education is conceptualised within the case study school through individual interviews and two focus group sessions. The analysis of these individual interviews and focus groups formed the rationale and shaped the content of Phase Two sustainability education and local curriculum design professional learning and development (SELCD PLD). In this chapter, the focus shifts to the professional learning and development sessions in the case study school. The second phase of this CPAR functioned as the intervention phase, designed to facilitated change by integrating sustainability education and local curriculum design into existing PLD structures. Within this phase there were three critical participatory action research (CPAR) cycles. As the facilitator, I led the PLD sessions with the aim of evaluating sustainability PLD and synthesising how practice arrangements in the case study school might enable sustainability education and local curriculum design. Two further focus group sessions were conducted, the first after five PLD sessions and the second at the end of Term Four, following the completion of seven PLD sessions. Additionally, individual interviews were conducted online via Zoom at the completion of the seven PLD sessions. Figure 4 provides a comprehensive overview of the data collection cycle.

Figure 4

CPAR Phases One and Two: Professional Learning Arrangements for Enabling Sustainability Education and Local Curriculum Design



Sustainability Education and Local Curriculum Design PLD

The second CPAR phase began after the first five SELCD PLD sessions. Session times and dates were scheduled by the school principal and integrated into the school's existing PLD schedule, with the intention of running as many sessions as possible over two terms. However, staff sickness and absence meant several PLD sessions were rescheduled or cancelled, resulting in seven sessions overall - four in Term Three and three in Term Four. The PLD titled, *Hā Hauora Tangata: Reconnecting with other, nature, and place,* was based on findings from Phase One and focused sustainability education and pedagogy, as well as the local area. The first session was a full day co-ordinated between the principal, the local iwi, and me, with the morning spent in the community, learning local history and pūrākau (stories) and the afternoon returning to school for PLD. The remaining six 90-minute after-school sessions were planned responsively each week, drawing on data from Phase Two and emerging needs identified during the PLD. Table 9 outlines the first five sessions, with detailed agendas provided in Appendix I.

Table 9

Overview of SELCD PLD Content Following Focus Group Two

PLD Date:	Session Foci:
PLD 1 26/8/22	PLD 1 session purpose was to: • **gain** a shared understanding of sustainability, sustainability education and local curriculum. • **identify** sustainability issues. • **use** our understanding of sustainability to **identify** the challenges and concerns of a significant place in the local area.
PLD 2 31/8/22	PLD 2 session purpose was to: • **gain** a shared understanding of our shared values and how these impact our teaching. • **identify** environmental challenges in the local area. • **use** our understanding of the Heart, Head, Hands model to identify learning and teaching opportunities that reconnect with nature.
PLD 3 8/9/22	PLD 3 session purpose was to: • **gain** a shared understanding of the types of action and associated attitudes related to action competence in Education for Sustainability (EfS). • **identify** community challenges in the local area. • **use** our understanding of action competence to create an action plan for a local issue. • **identify** how children's picture books can support EfS learning.
PLD 4 28/9/22	PLD 4 session purpose was to: • **gain** a shared understanding of points of entry when planning inquiry learning. • **use** our understanding of the Heart, Head, Hands model to identify learning and teaching opportunities that reconnect with nature.
PLD 5 19/10/22	PLD 5 session purpose was to: • **gain** a **shared understanding** of systems thinking as an approach to teaching sustainability. • **understand** that national and global issues can also be local issues and that we can make a difference. • **use** our understanding of Sustainable Development Goal (SDG) 12, *Responsible Consumption and Production*; to identify ways we can encourage our students to live better on our planet.

Planning for Sustainability Education PLD

Focus Group Three

After the initial five SELCD PLD sessions, a third focus group discussion was held to assess how the SELCD PLD was influencing the school's curriculum and to plan the next steps for SELCD PLD to address the teacher participants' and school's needs. This section of the Phase Two findings from the critical participatory action research (CPAR), examines insights from Focus Group Three (FG3), which consisted of the primary teaching team and the members of the senior leadership team, totalling six teacher participants.

The focus group discussion (FG3) was analysed using a practice architectures framework (see Kemmis, 2022; Kemmis et al., 2014b) to evaluate sustainability PLD and synthesise how the school's practice arrangements might support sustainability education and local curriculum design. Like previous focus groups, this framework facilitated a critical analysis of the interconnections between SELCD PLD and teacher participants' sayings, doings, and relatings within the school. It helped to understand how specific discourses, material and economic arrangements, and forms of relationships influenced teacher participants' engagement with SELCD PLD.

This discussion provided insights into shaping the conditions and arrangements to support further SELCD PLD while identifying factors that either enabled or constrained action and interaction. The analysis explores the connections between practices and arrangements, categorised under the following themes: Sayings - forms of understanding, Doings - modes of action, and Relatings - ways of relating to each other and the world. Table 10 on the next page summarises the findings from Focus Group Three (FG3) using Kemmis' (2022) table of invention.

Table 10

FG3: Synopsis After Five PLD Sessions 28/10/22

Analysing the Entanglement Between One Practice and Another

The sayings, doings, and relatings of SEPLD become the practice architectures that shape the sayings, doings, and relatings of future SELCD PLD.	
Sayings *Forms of understanding*	*Thinking and talking about SELCD PLD become the cultural-discursive arrangements that shape ideas and thinking for future SELCD PLD.* • Sustainability can be worked into planning, different approaches to planning to consider, intentionality in planning is required. • Head, Hearts, Hands (HHH) makes planning for SE easier, all parts of HHH need to be considered in planning, planning must incorporate the 'hands' element or the learning shouldn't be done. • Thinking focused on sustainability during PLD has changed teachers thinking, actions and what is talked about/ discussed. • Sustainability integrates into everything, the curriculum can be viewed through a sustainability lens, thinking is about planning for sustainability.
Doings *Modes of action*	*Activities, work, and material arrangements of SELCD PLD become the material-economic arrangements that shape activities and work, and material arrangements of SELCD PLD.* • Resources shared in PLD can be used/have immediate use in class. • Learning in PLD links to the science topic (recycling) from Enviroschools planning. • Teaching children to be problem solvers/ thinkers and to act links to HHH planning model. • Covid-19 disrupted planning and PLD, time is needed to plan together (planning examples are required) and to explore resources. Time is a limitation for planning. • A lot of PLD in school, finishing off pre-Covid19 and existing PLD. • Frequent PLD on a topic is good and works well.
Relatings *Ways of relating to each other and the world*	*Relationships of power and solidarity in SELCD PLD become the socio-political arrangements that shape relationships of power and solidarity in SELCD PLD.* • A clear Kaupapa is desired (for the school/ planning), so all teachers are working towards the same thing. • There has been a lot of sharing of ideas and collaboration, planning is happening, and teachers are putting PLD learning into practice. There is a desire to share with the community. • Shared values are being developed among teachers. • There are a lot of ideas and expertise in staff. There is a desire for staff/ teachers to lead the learning. • Teachers support each other by sharing learning and collaborating, talking and naturally being in each other's spaces.

While Table 10 summarises the findings from Focus Group 3 (FG3), Table 11 (at the end of FG3 findings section) details how the school's practice architectures (set-ups and arrangements) influenced teaching practices. It shows the changes in teacher participants' sayings, doings and relatings from Time One (T1), Phase One where understanding the context was sought, to Time Two (T2), Phase Two where the PLD was evaluated.

Sayings: Forms of Understanding

The focus group discussion revealed a noticeable shift in teacher participants' thinking, discussions, and actions, which was largely attributed to the intense and deliberate focus on sustainability during the PLD sessions. Alicia's comments were representative of the sentiments expressed by the group. She explained how changes in thinking were occurring organically in the classroom as teacher participants engaged with sustainability concepts in their daily interactions with students. Alicia stressed that developing an understanding of sustainability should precede structured planning. She also emphasised the importance of fostering a problem-solving mindset among students through everyday conversations, highlighting the need for teacher participants to adjust how they communicate with students in order to cultivate critical thinking skills. As she stated, "I think just changing the way we think, act, and speak first and getting that kind of flow going and then the specific planning will come". Furthermore, she shared how the team was integrating the PLD into their teaching practice, noting that their understanding of sustainability was being passed onto students through, "problem-solving and general awareness and kōrero from the kids, it has flown out to them, they're talking about it now a lot more".

This shift in mindset towards problem-solving and critical thinking aligned with the teacher participants' understanding that the whole curriculum can be viewed through a sustainability lens. There was a growing awareness that sustainability concepts integrate into all learning areas, and this initiated a shift in thinking about planning for sustainability. Again, Alicia commented, "You could easily integrate sustainability into everything…" Although the team had not formally begun planning for sustainability, they acknowledged that it could be incorporated into their planning. Teacher participants suggested planning to be the one of the foci for future SELCD PLD sessions. Rangi expressed this in relation to the content of the PLD, "in terms of - not rethinking, but in the way planning can happen. All the bits and pieces you shared for planning… I'm ready to see how we can work that into the way we plan". When asked what should be included in further SELCD sessions, teacher participants mentioned integration and use of picture books to support the teaching of sustainability concepts and issues, resources to support the teaching of sustainability, and planning for sustainability.

Another recurring theme in participants' reflections was the value the head, hearts, and hands (HHH) framework (Singleton, 2015; Sipos et al., 2008) in supporting the planning and implementation of sustainability education. Teacher participants consistently recognised it as a useful and memorable tool for structuring their thinking and curriculum design. Mr. T described it as "winner, winner, chicken dinner," explaining that it helped him, and his students, connect learning activities to a deeper sense of purpose by clarifying the 'why' behind the work. "I'm really big on the why. There is no point doing anything unless you know what you're doing it. That's the same with the kids – they'll ask, 'Why? What's the point?' So the heart is a big thing, and I never thought about it that way before." For him, the heart element was particularly powerful, encouraging emotional investment and motivation,

something he hadn't previously considered explicitly but now viewed as essential to both his own and his students' engagement.

Others echoed this sentiment. Fred found the HHH framework beneficial "from an outside of the class perspective," noting that, "head and heart and hands actually narrowed it down easily." Beyoncé also highlighted its immediate practical impact, describing how staff kōrero (discussions) after PLD sessions often led directly to action. She explained that the HHH structure helped her team critically consider how to move from knowledge to emotion to meaningful action, saying, "we were like, how are we going to hit them with the knowledge and then make sure that they're also thinking with their hearts, and then actioning and doing something?"

Alicia shared a recent classroom experience in which students explored the environmental impact of rubbish in drains, demonstrating both problem-solving skills and deep engagement with sustainability issues. She described a "really cool ta-da moment" when students connected what they had learned to their surroundings, noticing rubbish in the school drains and discussing how it could reach the ocean. She reflected that the experience fostered authentic problem-solving, explaining that the head, heart, and hands approach had "been really good" for encouraging students to think critically about causes, impacts, and solutions. When asked about a key takeaway from the SELCD PLD, Beyoncé identified the HHH framework, noting that it helped remind her to include the 'hands' element of learning, taking action on real-world issues. She explained, "If we don't have a hands part, we don't want to do it", emphasising her enthusiasm for "hands-on" experiential learning. While this comment highlights the team's growing commitment to socially engaged teaching, it is important to clarify that within the HHH framework, the "hands" component represents the development of practical skills and implementation strategies, whereas the motivation and desire to act, which drives action, resides in the 'heart' domain.

Fred described the HHH model as a useful tool for focusing thinking and planning, while both Beyoncé and Alicia reflected on how the framework had influenced their inquiry planning. They described how they intentionally considered how to integrate knowledge (head), values (heart), and action (hands) into their students' learning. As Beyoncé explained, "When we were planning our inquiry this term, we were using the head, heart, and hand – thinking about how to hit them with the knowledge, make sure they're also thinking with their hearts, and then actioning, like doing something." She added that her team had even used their classroom Enviro display to map these stages, noting, "that part was the head, that was the hands, and that's the heart." While the HHH model provided a supportive foundation for sustainability-focused planning, teacher participants also expressed a readiness to explore additional frameworks as their understanding developed.

Doings: Modes of Action

Analysis of the focus group data showed that resources shared in the PLD space were integrated into classroom practices. Beyoncé highlighted their immediate applicability, explaining that ideas discussed during PLD "came straight back into our inquiry and Enviro stuff," helping to connect professional learning to classroom realities. Fred echoed this, describing how post-PLD kōrero (discussion) among staff often translated into direct action:

> Being able to hear them kōrero after the PLD and actually take action from it straightaway has been great. You can feel the mood about planning and talk about the possibilities we could do with our kids. The resources too, we've used them straightaway and it's opened up thinking, well actually there's a lot of resources out there. (Fred)

His reflection illustrated how PLD sessions fuelled enthusiasm and broadened the teacher participants' perspectives, encouraging them to move beyond habitual approaches and explore more relevant and creative learning opportunities.

Building on these reflections, Alicia noted the abundance of untapped sustainability resources but raised concerns, echoed by Rangi, about time constraints that limited exploration and adaption of materials to local issues and year levels. As she explained, there were "heaps of resources out there that we don't even know about," but limited time to explore and use them effectively. Her reflection highlighted both the potential richness of available materials and the persistent challenge of accessing and curating them meaningfully. However, rather than time itself being the sole limiting factor, this constraint was shaped by the material-economic arrangements within the school, such as timetabling structures and competing priorities that dictated how professional learning and curriculum development were scheduled. Thus, the ability to explore sustainability resources was not just a matter of individual effort but of institutional organisation and prioritisation.

The pervasive issue of how time was structured and allocated emerged throughout the focus group discussion, encompassing the need for collaborative planning, resource exploration and preparation, example creation, and timetable adjustments. Covid-19 disruptions compounded these work constraints, disrupting school routines and PLD sessions. As Fred explained, "all PLD was stopped and then they opened the doors and we had to finish it this year…we've just been shoved." When asked about how much PLD was happening in the school, the resounding answer was, "too much". Fred attributed this overload to the disruptions caused by Covid-19, explaining that once restrictions lifted, schools were pressured to "tick off" a backlog of PLD commitments within a short timeframe, leaving little opportunity for deeper engagement. The SELCD PLD specifically faced cancellations and rescheduling due to teacher absences, further impeding progress. Additionally, competing demands such as assessment data collection and report writing in Term Four emphasised the scarcity of time outside of scheduled meetings. Moreover, the backlog of pre-Covid-19 PLD

initiatives, exacerbated by the government's response plan, compounded the challenge of navigating institutional constraints on time allocation rather than simply individual time management.

While teacher participants recognised the benefits of regular PLD, they emphasised the need for a more structured and strategic approach to scheduling, particularly given the volume of professional development undertaken in 2022. Alicia agreed with Rangi that the SELCD PLD should occur more frequently, stating, "I like the idea of it being closer together because otherwise you learn it and then you lose it." Mr T. supported this view, noting that consistency helped to sustain focus and momentum. Alicia further explained that frequent sessions made the learning more meaningful because, "you can actually use it." This shared emphasis on maintaining continuity and relevance prompted Rangi and Mr. T to suggest reconsidering the school timetable and PLD scheduling to better prioritise sustainability education and local curriculum integration.

Despite these scheduling challenges, evidence of transfer from PLD to classroom practice was apparent. Although Enviroschools discussions were limited during the focus group discussions, teacher participants from the junior school drew connections between SELCD PLD, science box learning, and the Enviroschools programme, particularly in the context of their 'recycling' learning focus. The team referred to their classroom wall display and identified different aspects of head, heart, and hands learning. Cardi also explained that her class had been "doing lots of recycling" and that they were still practicing it as an action. She mentioned that on one occasion the class dug into the reason why it was important to recycle. The class watched a video clip about the rubbish going into the oceans and affecting the turtles. She said that after watching the video the class wanted to save the turtles. This example emphasises the importance of students understanding the emotional and value-driven purpose behind their learning, highlighting the 'heart' aspect of the HHH framework. It also emphasises the significance of anchoring learning within local contexts where students can actively engage with relevant issues.

Relatings: Ways of Relating to Each Other and the World

Amidst this exploration of sustainability education through the SELCD PLD, the focus shifts to the social dimensions of teacher practice, how educators relate to one another, exchange ideas, and foster collaborative ways of working. Within this domain of relatings, teacher participants highlighted the significance of shared values and mutual support in shaping their professional learning culture. Rangi emphasised that these values were, "not just school-wide, but individual as well", suggesting that sustainability was becoming embedded not only in school-wide initiatives but also in personal professional identities.

Alicia expressed her appreciation for reciprocity and exchange of ideas through informal collaboration. She described how, during shared teaching and learning, the Kaupapa focused on setting up class 'shops', teacher participants actively sought each other out for ideas and inspiration.

“We were sharing ideas,” she recalled, adding that it was common to see teachers visiting each other’s classrooms to build on one another’s work. Maria similarly valued these exchanges, describing the organic nature of conversations with colleagues like Cardi: “She’ll come down and be like, ‘What are you doing for this?’ And we’re like, ‘What are you doing?’…and then she’s like, ‘I might do that.’” These moments reflect a strong relational dimension to the PLD process, one based in collegiality and trust.

Rangi, recognising the value of this interaction, voiced a desire to create more structured opportunities for collaboration. She suggested allocating dedicated planning time, noting that staff “would appreciate having a day or two where we lay it all out on the table, think through the steps, and plan what’s needed for success with our tamariki (children).” Such uninterrupted time, free from competing priorities like assessment or reporting, was viewed as essential not only for effective curriculum planning but also for embedding sustainability education into teaching practice. “It’s about changing our practice,” she reflected, lamenting how Covid-19 had disrupted the school’s previous collaborative routines.

This emphasis on collaboration highlights how the SELCD PLD cultivated a culture of collective agency and relational professionalism within the specific realities of their own school context. Teacher participants were not only developing their understanding of sustainability education but doing so through a model that reinforced mutual support, shared vision, and the belief that meaningful change is a collective endeavour. This shared commitment extended beyond idea-sharing, as teacher participants actively applied the PLD in the classroom. Fred reflected on the positive shift in planning conversations, describing how the discussions “opened up thinking” and generated excitement about learning possibilities across the school. Mr. T echoed this sense of collective momentum, explaining, “I’ve really enjoyed the journey…It’s been nice having everybody focused on their teaching – on all of us. It’s really cool.” His reflection highlighted the value of a shared focus and collegial learning as sources of professional energy. Cardi highlighted how the team’s strong relationships and a sense of stability created a safe space for openness and learning: “We’re in a place where we can ask questions and ask for help and be humble.” Her reflection captures the trusting culture that was foundational to the group’s collaboration, one that balance professionalism with humour and familiarity, fostering both comfort and accountability.

While the idea of having a clear term-based Kaupapa was widely discussed, Cardi raised concerns about the number of competing influences shaping teaching, noting that the multitude of external voices sometimes led to confusion during planning. She explained, “We always get one Kaupapa, but with so much PLD and so many voices, it gets confusing.” Alicia described the value of shared direction, stating, “It would be cool to have a clear kind of Kaupapa for the term - we’re all on the same Kaupapa, clear as day, and all working towards it.” She suggested that integrated, Kaupapa-

based learning could strengthen coherence across the school, supporting alignment between classroom practice, professional learning, and shared responsibility for sustainability education.

Collaboration emerged as a prominent theme throughout this focus group discussion, highlighting the relational and power dynamics of professional learning within the school. Rangi emphasised the significance of creating time for reflective conversations and collaborative planning, recognising their inherent value in developing a shared approach to learning and teaching. She advocated for empowering teacher participants to take the lead in areas of personal strength and expertise, shifting the reliance away from external PLD providers. “It’s safe to say next year we’re all going to have areas… that’s going to be better and you're going to enjoy it… we’re going to be leading it for each other.” Rangi’s comment reflected an increasing sense of ownership and agency within the teaching team. She also highlighted the collaborative culture already forming, noting the willingness of teachers to visit each other’s classrooms, share practices, and learn from one another, describing this as “a definite positive” that would support their willingness to lead learning based on their passions.

Rangi’s insights signal a shift in the social-political arrangements of the school, from hierarchical to more horizontal structures, where leadership is shared, and professional learning is collaboratively driven. This approach not only fostered shared learning but also allowed teachers to lead one another’s growth in areas of personal strength. These evolving leadership structures both enabled and constrained opportunities for collective agency, particularly as the team responded to curriculum changes. Reflecting on this, Rangi noted how participation had expanded over time, observing that “everybody in this forum is having multiple contributions.” She also suggested that senior leaders could structure PLD more intentionally “for our site so we’re not confused or confusing the different settings in our school.”

This focus group discussion (FG3) in Phase Two of the research provided invaluable insights into the integration of SELCD. However, the focus group also highlighted areas that the team wanted to explore during further SELCD PLD sessions. Building on the first five SELCD PLD sessions and the subsequent findings from FG2, further PLD sessions were planned to incorporate the teams desire for more time investigating resources that would support the teaching of SELCD. Furthermore, the request from the team for dedicated time focussed on sustainability and local curriculum planning was added to the PLD schedule.

Table 11

Synopsis of Learning: Coming to Practice Differently – Situated in How PLD is Arranged to Enable Sustainability Practices to be Developed

Practices	Practice architectures
Sayings **From (T1)** *PLD is seen as an opportunity for growth and need to develop a common understanding of sustainability, SE and SELCD, as well as link to local community and local issues, nurture individuals and focus on life skills rather than solely on academic targets.* **To (T2)** *Teacher participants are enthusiastic about incorporating sustainability and problem-solving into education. Changing teacher talk to encourage students to explore and understand 'why' behind their actions, adopting HHH approach to make SE more accessible and engaging for students.*	**Cultural-discursive arrangements** **From (T1)** *Must link PLD to local area and connect with community to cultivate local identity, sustainability, and life skills through connection to local culture, identity, and the environment.* **To (T2)** *Equip teacher participants with tools and knowledge to integrate sustainability concepts seamlessly into classrooms, cater to teacher's needs by providing PL focussed sessions that cover a range of valuable resources, ready-made lesson plans, innovative ideas, etc.*
Doings **From (T1)** *Hands-on practical learning: modelling and doing, experiential learning where teacher participants are actively engaged through hands-on practical activities is important during PLD, rather than passive listening/ telling.* **To (T2)** *PLD resources provide immediate practicality and encourage students to explore sustainability topics in more depth through meaningful conversations, explorations and problem-solving. Able to use resources right away to tackle real-world problems.*	**Material-economic arrangements** **From (T1)** *Flexible approach to sustainability professional learning sessions, design sessions to bring clarity through comprehensive frequent sessions.* **To (T2)** *Time and support to engage in strategic planning and successful sustainability integration, acknowledging challenges of limited timetables, disruptions caused by Covid-19 and growing class sizes. To avoid overload, PLD should be broken down into frequent, shorter sessions.*
Relatings **From (T1)** *PLD together is more meaningful and powerful if everyone sees the value in the PLD experience. By engaging in the learning process as a team a strong foundation will be created for mutual support.* **To (T2)** *Working together towards a shared vision and clear integrated Kaupapa-based approach. Sharing of ideas is promoted, staff collaboration in PLD is powerful when it leads to actionable outcomes. Immediate action from PLD insights can foster a positive atmosphere for planning and exploring possibilities with students.*	**Socio-political arrangements** **From (T1)** *Collective participation and collaboration within the team is needed for successful and sustainable PLD. Doing it together to support each other on the learning journey to empower everyone to contribute to the vision, giving opportunities for each participant to have their say and take ownership in shaping the curriculum.* **To (T2)** *Challenges faced due to Covid-19 meant meeting the needs of people first, ensuring wellbeing of students and staff before learning. Emphasis is now on starting afresh, building a supportive and collaborative learning environment through involvement of the team in generating ideas and setting priorities.*

Note. Time 1(T1) = FG2: Data from FG1 + Int One 07/07/22 and Time 2 (T2) = FG3: After five PLD sessions 28/10/22

Evaluating Sustainability Education PLD

Focus Group Four

The second focus group discussion in this phase of the CPAR (FG4) took place at the completion of the SELCD PLD, following seven SELCD PLD sessions. The purpose of the focus group was the same as FG3, to evaluate the sustainability PLD and synthesise how practice arrangements in the school might enable sustainability education and local curriculum design. Analysis of the focus group discussion was completed using the same practice architectures framework as the previous two focus groups (Kemmis, 2022; Kemmis et al., 2014b). This framework facilitated analysis of the interconnections between the conditions that make the practices of SELCD PLD possible and the sayings, doings and relatings of teachers' practices. A summary of these findings can be found in Table 13 on the next page. Due to staff sickness and limited time, only two additional SELCD PLD sessions were able to be delivered. An outline of what each session included is provided in Table 12. The agenda for each session can be found in Appendix I.

Table 12

Overview of SELCD PLD Content Following FG3

PLD Date:	Session Foci:
PLD 6 9/11/22	PLD 5 session purpose was to: • **identify** sustainability themes found in picture books. • **explore** how picture books can be used to teach sustainability themes.
PLD 7 21/11/22	PLD 5 session purpose was to: • **understand** the structure of the NZC Social Sciences curriculum. • **use** the refreshed Social Sciences curriculum document to outline an integrated Social Sciences unit plan related to the local area using a sustainability lens.

Table 13

FG4: Synopsis After Seven PLD Sessions 5/12/22

Analysing the Entanglement Between One Practice and Another

The sayings, doings, and relatings of SELCD PLD sessions become the practice architectures that shape the sayings, doings, and relatings of future PLD in SELCD.	
Sayings *Forms of understanding*	*Thinking and talking about SELCD PLD become the cultural-discursive arrangements that shape ideas and thinking for future PLD.* • It is important to learn about the local area. • There has been a growth in understanding and awareness of sustainability as a concept and lens. • There are links between sustainability frameworks and Enviroschools work, e.g., 'Beautification Project'.
Doings *Modes of action*	*Activities, work, and material arrangements of SELCD PLD become the material-economic arrangements that shape activities and work, and material arrangements of SELCD PLD.* • Time is needed to plan and build resources into planning, to make a 'resource box'. • The learning journey involves the whole school and needs to be set up and planned for using HHH framework. • Implementing new things from lots of PLD is difficult and adds to the 'cognitive load' (There has been a lot of PLD this year).
Relatings *Ways of relating to each other and the world*	*Relationships of power and solidarity in SELCD PLD become the socio-political arrangements that shape relationships of power and solidarity in SELCD PLD.* • The team are a very supportive group to learn with. • Practices of SE are enabled due to PLD done together. It opened the door for greater collaboration, sharing ideas, working together more, and planning together.

Sayings: Forms of Understanding

In this focus group discussion, teacher participants identified learning about the local area as a positive aspect of the SELCD PLD. Alicia highlighted how the bespoke, localised nature of the PLD deepened her understanding of the community she was teaching in. She reflected that, "it has been really good to learn because it [PLD] is localised to our own area," and that it encouraged her "to look at our own history here and how we have been able to link it to teaching and the curriculum." Luther acknowledged the potentially overwhelming nature of sustainability, given its broad scope but emphasise the power of small, local actions: "You can do little things yourself in your own home, at school, or in your own community. It doesn't have to be this massive global kind of thing, it can be very local, and it helps." This recognition grounded the group's understanding of sustainability in tangible, community-based practice, opening avenues for actionable discussions and initiatives.

Alicia further elaborated on how SELCD PLD complemented their Enviroschools teaching and learning programme. She highlighted its role in enhancing awareness of sustainability issues and fostering discussions within the classroom, particularly regarding local environmental challenges such as landfill impact and recycling practices. Reflecting on this, she explained that there was now "a lot more awareness and kōrero happening," explaining that her class had taken action through "the drain thing we've been working on… the impact of the landfill and recycling." These included exploring the historical usage of the awa (local river), the journey of local waka (canoes), pūrākau about river-dwelling taniwha (traditional narratives about guardian spirits), and the locations of marae (Māori meeting houses and settlements) along the river. Such conversations reflected a shared excitement for weaving sustainability and local knowledge into future teaching practices, emphasising the importance contextualising sustainability education within local environments.

In the focus group discussion, teacher participants demonstrated significant growth in their understanding and awareness of sustainability as both a concept and lens through which to view the curriculum. Their reflections revealed how shared language and dialogue, the sayings of practice, were evolving through the SELCD PLD. They began sharing ideas for teaching in the following school year, drawing on ideas, activities, resources explored during the sessions. Beyoncé spoke about mapping out the local area and naming the taniwha, acknowledging the importance of extending her own knowledge to teach her students: "I don't know about that, so the kids probably don't know." Alicia similarly suggested tracking the awa (river) and the waka (regional tribal canoe), "actually tracking where it went and where it stopped."

Rangi described this developing discourse as evidence of the team's growing confidence in integrating sustainability and local contexts into planning: "From my perspective… it's seeing their growing confidence in having these thoughts and making that planning. I thought it was really good." Similarly, Seamus reflected on the SLCLD PLD, noting that "it's kind of a type of teaching," while Alicia extended this thinking, suggesting that sustainability offers a lens through which any Kaupapa could be explored: "You could link any Kaupapa into sustainability education."

The SELCD PLD provided learning that supported teacher participants, as Beyoncé put it to, "dig in deeper" into issues that enhance students' understanding of local contexts. She explained how frameworks such as the United Nations Sustainable Development Goals (UNSDGs) and Good Life Goals (GLGs), along with the holistic head, heart, and hands approach, guided her students' learning in tangible ways. For example, Beyoncé connected SDG14, Life Below Water, to the school's Enviroschool beautification project, where students designed drain art to highlight the environmental impact of what enters the drainage system. She observed that, "even the juniors, when they put the food scraps in [the compost bin], they take note if there is rubbish in there… Some of them take it out themselves, others just make a little noise – 'ooii' [to draw attention to it]." Through activities like

rubbish collection and drain monitoring, sustainability concepts became embedded in students' everyday actions and awareness.

Similarly, Alicia emphasised how these frameworks made sustainability education more manageable, stating, "It was helpful to have specific areas that we could focus on because sustainability is quite a big broad Kaupapa. It was easy to link the learning to those. It just made that a bit more manageable". She also reflected on how the teacm's thinking had evolved across the focus groups, moving from general ideas about sustainability to more concrete discussions of classroom practice: "In focus group one it was quite general, we were just saying it's relevant and practical. But now we can actually talk about what we've learnt it's more specific to what we've done." This progression demonstrates the growing depth of understanding among the teacher participants, highlighting the value of structured tools and frameworks in supporting teachers to plan and deliver meaningful sustainability learning experiences.

Doings: Modes of Action

An aspect of the SELCD PLD that teacher participants noted as positive was the introduction to the many and varied resources that support teaching and learning. In addition to the UNSDG and HHH frameworks, teacher participants noted the use of children's picture books to introduce, think about, and discuss environmental, social, cultural, and economic issues. Ana explained that she had only read picture books for enjoyment, adding, "I never knew how many we could relate to day-to-day life and sustainability in our environment." Alicia mentioned that, following the SELCD PLD sessions, she had purchased several of the picture books used in the workshops to use in her classroom.

Rangi and Luther also acknowledged the usefulness of the resources shared and used during the SELCD PLD. Beyoncé appreciated the introduction of relevant websites that supported the exploration of local cultural sustainability, such as a digital tool for locating local marae along the awa (river). This tool could be used alongside council and organisational websites to examine aspects of the river. Mariah found that the "Zoom in and out" digital images by artist Chris Jordan particularly thought-provoking, such as his 2011 image of a whale composed of 50,000 plastic bags. She created a game with her students using these images and then incorporated the science boxes to support deeper learning. Rangi raised the issue of time, reiterating that time was needed to plan and integrate resources effectively. Alicia expanded on this, suggesting that time was also needed to create "resource boxes" for each unit of work: "It's all there - the resources, everything's there - planned by week and broken into bite-size pieces, so you can just teach it." She also proposed redesigning the school's unit-planning template to include a sustainability component so that the SELCD PLD could be more readily applied in practice.

In addition to requiring resources and time for sustainability and local curriculum planning, there was a need to involve the whole school in the learning journey. Both Rangi and Alicia recognised that

team planning with the same Kaupapa was important, as were the resources and the learning progressions to support the Kaupapa across year levels. The UNSDG and HHH frameworks were considered essential to include in future planning templates, and planning was a recurring topic of discussion. Rangi described the current routine, where a termly overview was collaboratively developed and uploaded into Google Docs for staff to access. However, she noted that “we probably don’t click on it enough,” adding that while robust kōrero occurred, “there’s not enough connection” between the term overview and the weekly planning. She suggested developing a more comprehensive A3 planning template that could capture the team’s ideas and serve as a living document for each term.

Both Rangi and Alcia proposed redesigning planning templates to better align with the school’s sustainability vision and reduce the use of outdated formats. While much of the discussion focused on digital planning tools, Seamus pointed out that when information is saved on the computer, the Kaupapa became hidden. He suggested creating a visual reminder in the staffroom: “I would include a broad overview that you can see on the wall, so it’s not hidden away in your computer.”

While the team acknowledged that some changes were needed in their planning, they also expressed feeling overwhelmed by the amount of PLD they had engaged in throughout the year, in addition to the SELCD PLD. Several teachers noted the cognitive load stemming from these multiple learning initiatives. Alicia reflected that: “There has been a lot of PLD this year. Some of us have done heaps. It’s been full-on. Probably actually nearly sometimes too much”. Seamus agreed and explained that the pressure of time meant that some learning was not able to be transferred into classroom practice.

Despite the heavy workload, the focus group discussion revealed constructive ideas for managing future PLD within the material-economic arrangements of the school, particularly around timetabling and competing demands. Alicia proposed a practical solution, suggestion that sustainability planning could be embedded into regular planning sessions next year. She envisioned “a sustainability plan in there for each term,” with a clear goal and a clear Kaupapa so that “now it’s applying an actual Kaupapa” into teaching practice. This approach, she argued, would ensure that sustainability became an explicit and actionable focus across the year.

Although Rangi acknowledged that the team were at the “tail end of things” after an intensive year of professional learning, she also raised concerns about the upcoming curriculum refresh and the need for further time and exploration to implement these changes effectively. Building on Alicia’s suggestion, she emphasised the importance of dedicated time not only for collaborative planning but also for building resources and mapping a coherent “learning journey across school.” These ideas reflect how the SELCD PLD was beginning to shift thinking toward more sustainable and embedded professional learning structures.

The timing of PLD delivery sparked further discussion among teacher participants. All agreed that afternoons following a full day teaching, often the default for school PLD, were the least effective. They preferred full-day sessions, such as one per term, or regular ongoing PLD. Teacher participants also suggested scheduling PLD earlier in the year to allow for immediate integration into classroom teaching and learning. While the teaching team contended with complexities of planning amidst unexpected events and a busy term, their ongoing discussions and adaptations reflected a commitment to collaborative practices.

Relatings: Ways of Relating to Each Other and the World

Data from this and previous focus group discussions revealed that the teaching team in the case study school were highly supportive of one another's learning. Ana described the group as being supportive to learn alongside, noting her own growth in understanding of sustainability. The shared nature of the PLD enabled collaborative practices, opening opportunities for greater idea sharing, teamwork, and planning together.

Looking ahead, Beyoncé and Seamus both suggested that future PLD could include modelled lessons as a starting point for sustainability learning. Beyoncé explained, "Maybe like modelling how you would teach it. I used to like it when Brian would come in and model the lessons." Seamus agreed, suggesting, "Maybe a good, modelled lesson and then you can develop it form there. We can all start off with that." Alicia offered another perspective on enhancing collaboration, proposing the creation of a shared "launchpad" that would outline key Kaupapa, main teaching points and linked resources. She believed such a tool would strengthen consistency and resource sharing across the school.

Collaboration was further facilitated by the SELCD PLD research project because the team were engaging in the SELCD PLD together. Rangi explained that the SELCD PLD had enabled teacher participants to collaborate and impacted classroom team structures in the reorganisation of teaching teams for the following school year. Alicia identified the PLD as opening the doors for collaboration and stated that the following school year would see "a lot more collaboration". She said that the team had already been discussing ideas for the next school year, that they were collaborating across the school, and that people were "more willing to work together".

However, at the time of FG4, planning for the next school year had been delayed due to the principal's absence and an exceptionally busy term. Teacher participants proposed using teacher call-back days to begin collaborative planning prior to the new school year. As Rangi pointed out, though, senior leaders had not been able to meet in person: "Everything is said over email, and you can interpret things or forget things." Her reflection demonstrated how logistical barriers and reliance on digital communication limited opportunities for face-to-face collaboration.

Overall, the findings from this focus group discussion illustrate the interconnection between the sayings, doings, and relatings of practice within the case study school. Teacher participants demonstrated a progression from developing shared understandings of sustainability (sayings), to implementing concrete actions and a desire for planning processes that embed these ideas into classroom practice (doings), and to strengthening the relationships and collaborative structures that supported this work (relatings). Together, these arrangements reveal how the SELCD PLD contributed to a growing sense of collective agency where sustainability education was viewed as an integrated, relational, and contextually grounded aspect of teaching and learning. While challenges such as competing priorities, limited time, and structural constraints persisted, participants' reflections signalled a shift towards a more connected and purposeful practice. Moving forward, continued attention to the relational and material conditions that enable collaboration and sustain shared purpose will be essential to maintaining momentum and deepening engagement with sustainability education across the school.

Evaluating Sustainability PLD: Individual Interviews

Arrangement of PLD to further enable SE to be developed

Individual Interviews

Phase Two of the research cycle culminated with individual interviews. These were conducted online via Zoom with the aim of further evaluating sustainability PLD to understand how professional learning might be arranged to further enable sustainability practice to be developed. The interviews took place once the SELCD PLD had ended and followed focus group four (FG4). Thematic analysis of this second round of individual interviews generated four broad themes evaluating sustainability PLD and the practice arrangements that enable SELCD, specifically 'holistic sustainability education', 'hands-on sustainability teaching, 'sustainability planning journey', and 'continuous learning and local expertise'. Each of these themes provide the structure for the rest of this chapter.

Theme 1: Reframing Understanding: Embracing Holistic Sustainability Education

This second round of interview questions (see Appendix J) were designed to evaluate the sustainability PLD programme's effectiveness and its impact on teacher participants' understanding of sustainability and sustainability education. Nine teacher participants took part in the interviews. Overall, the interview responses revealed a notable growth in comprehension among teacher participants, with all teacher participants characterising sustainability and sustainability education as interconnected and holistic. When asked about their understanding of sustainability, Mr. T succinctly defined sustainability as ensuring that people leave things better than they found them: "It's all about future proofing and ensuring everything is better than how we found it." His response emphasised the broader scope of sustainability beyond environmental concerns to encompass, "…relationships, community, every aspect of your life."

Mariah admitted to having no prior understanding of sustainability during the initial interview stating: “When I first sat down with you in the first interview, I literally had no idea of what it was about. I know it had something to do with sustaining something, whatever that something was I had no idea about.” However, in the follow-up interview, she expressed a newfound comprehension that individual decisions could contribute to the world as a “better place”: “Now I feel like I have more of an understanding of the problems in our world and how we can make slow choices to change…the changes we make in the future will shape the world into a better place.” Similarly, Cardi acknowledged her confusion about sustainability in the first interview but credited the PLD programme and the support she received for fostering a deep understanding and passion for sustainability: “At the very beginning, I was confused in all the different ways that I interpreted it. Now I know that sustainability is something ongoing, that we can reuse, utilise, with changes – the way of always building to become better.” She highlighted a shift from viewing sustainability as merely “hangarua” (recycling) to recognising it as kaitiakitanga, the guardianship of existing resources, particularly within Te Ao Māori. Cardi emphasised the significance of sustainability within Te Ao Māori, stressing its alignment with principles of resource stewardship and cultural preservation. She expressed her commitment to incorporating sustainability into her practice, recognising it as integral to maintaining the mana (prestige) of Te Ao Māori.

Specifically related to sustainability education, teacher participants described the connections between the environmental, economic, social, and cultural aspects of sustainability and linked it to learning that would help to make the world a better place. Seamus explained sustainability education involves being connected to, “everything, from feelings, to learning, to your own thoughts.” He believed his understanding of sustainability education had expanded from thinking of it solely as, “systems to help us sustain things,” to recognising it as a broader concept encompassing actions individuals can take to improve the environment and the world in which they live: “Now I seem to think it’s more about our environment and our world, where we live and what we can do to make it better.” Beyoncé summarised her shift in thinking around sustainability education stating, “I see that it’s in everything, especially with the head, heart, and hands. That was a big takeaway for me.” She emphasised the HHH model and SDG frameworks were catalysts in helping her to understand how to integrate and teach sustainability concepts.

Another aspect of sustainability that was broadened during the SELCD PLD was teacher participants’ understanding around the future focused aspect of sustainability. During the initial interviews, and prior to the commencement of the PLD, six of the eight teacher participants described sustainability as something ongoing or lasting, what Mariah referred to as something that could “continue to be used throughout time”. The second interview following the SELCD PLD, however, revealed that eight of the teacher participants extended their understanding. Of these, four specifically explained sustainability as including a ‘future focused’ perspective. Alicia explained: “We

are teaching the future, we want to inspire them to look after and appreciate it. It's being a citizen in this world and our job is to make sure the future looks after and preserves what we have." She recognised the significance of the teaching role to inspire future generations to carry on looking after the world and its people. Mr. T described sustainability as "futureproofing", ensuring everything is better than when we found it. Similarly, Luther viewed sustainability as beginning with education, explaining that students should "start small… at home or around their kura (school)… every little bit helps." His reflection showed an awareness of how small, local actions can contribute to global change. The second round of interviews, therefore, demonstrated a positive impact of the PLD programme on teacher participants' understanding and appreciation of sustainability, highlighting its relevance within environmental, social, cultural, and economic contexts.

Theme 2: Head, Heart, and Hands in Action: Transforming Teaching and Inspiring Students for Sustainability

The head, heart, and hands (HHH) model emerged as a pivotal framework influencing teacher participants' teaching practices, as noted by six out of nine teacher participants. This model supported various aspects, including understanding sustainability education, planning for sustainability, and integrating it into local curriculum. Key teacher participants, such as Alicia, Mr. T, Beyoncé, and Seamus emphasised the model's impact on their approach to sustainability education. Alicia highlighted the importance of the 'hands' component, explaining that wen students move from discussion to action, "they see it in real life… it uplifts their confidence and gives them home they can make a change."

Building on this foundation, Beyoncé envisioned future learning opportunities such as exploring stormwater flow and its impact on local water bodies. She emphasised student-driven initiatives, like raising awareness about proper waste disposal and creating artwork around storm drains to promote environmental stewardship and social responsibility in the junior classrooms. Reflecting in the HHH model in action , she explained, that after learning about wase and visiting a former landfill site, "the kids were really moved, they wanted to make a difference, to show only rain goes down the drain," Similarly, Alicia integrated the HHH model into her teaching over two school terms, particularly focusing on raising awareness about waste disposal and its consequences. She highlighted the importance of the hands-on component in translating ideas into action, empowering students to effect tangible change and fostering a sense of agency. Alicia explained, "When you do the hands part, it puts it into practice, and they (students) feel like it really uplifts them and their confidence and gives them hope that they can make a change." Cardi expressed surprise at how passionate she had become about sustainability. She explained how students enjoyed the 'hands-on' aspect of the HHH model, referring to it as "the hands-on mahi". She believed this experiential approach to learning helped students to better grasp concepts, effectively complementing the 'head' component of learning. In her class, she observed that heart-centred learning often emerged

naturally through action and hands-on experiences. She looked forward to integrating the new teaching and learning approaches from PLD into future planning to support the Kaupapa.

Reflecting on his experience integrating the HHH model into an Enviroschool inquiry, Mr. T recognised the need for emotional engagement to inspire passion and motivation among students. By incorporating the heart aspect into his teaching, he aimed to cultivate a deeper connection to environmental issues, driving meaningful action. Mr. T shared, “I struggled to get passion from the Year 7 and 8 students… but the addition of the heart aspect in learning made me look at ways to motivate and inspire students.” He also highlighted the importance of using the United Nations Sustainable Development Goals framework (Osman et al., 2017; UNESCO, 2017) and the child-friendly Goodlife Goals framework (Futerra Sustainability Communications, 2019) to guide transformative learning experiences that engaged the head, heart, and hands. Seamus likewise emphasised the power of emotional and social engagement, explaining that sustainability learning “wasn’t just learning – it was feelings and social interactions, and finding ways you can do something about it.”

Overall, teacher participants highlighted how their engagement with the HHH model transformed their teaching practices, enabling them to support students to develop empathy and a sense of agency in promoting sustainability. However, this transformation did not just come from the model itself, but from how the teacher participants and students engaged with it within the practice architectures of the school. The cultural-discursive arrangements shaped how teacher participants talked about and made sense of sustainability education through the HHH framework. The social-political arrangements, including collaborative relationships, leaderships structures, and power dynamics, influenced how teacher participants engaged with and implemented the model. Additionally, the material-economic arrangements, such as timetabling, resource availability, and competing PLD priorities, either supported or constrained its integration into classroom practice. The power of the model, therefore, was not in its structure, but how it was taken up and enacted with these interconnected practice architectures.

Theme 3: Planning for Sustainability and Local Curriculum Design: Journey from Learning to Implementation

At this stage in the research project, the school had not adopted a school-wide approach to sustainability planning, a situation shaped by both material-economic constraints (such as time and resource availability) and social-political arrangements (particularly the absence of a structured, collaborative planning process). Time was needed to integrate the ideas from the SELCD PLD into school-wide planning. The teaching team, however, were enthusiastic about what they were learning and began to include the SELCD PLD material into their teaching in informal ways, illustrating how

cultural-discursive arrangements, including new language, concepts, and frameworks introduced in PLD, shaped their emerging sustainability practices.

Several participants described how the PLD promoted a shift in their thinking. Rangi, for example, noted that she had started to look at the curriculum "through the lens of sustainability," with questions of how it would work for the school often "in the back of [her] mind." This reflection captures the early cognitive engagement with sustainability frameworks, even while practical implementation remained an evolving challenge. Similarly, Mr T highlighted the PLD's role in clarifying direction, describing it as "nice to have a focus on it [sustainability]" and acknowledged that while many staff found it difficult to determine specific next steps, the PLD had been "a big part of helping [them] to understand the steps [they] need to take." His comments point to the role of professional learning in not only vision-building but also providing necessary scaffolding for systemic change.

Mariah's reflections captured a growing sense of confidence among the teaching team. She described the past year as a process of "trial and error" but expressed excitement about how lessons learned would inform more deliberate planning in the coming year: "Next year we already know how to put this into our planning and where to move next." Her enthusiasm illustrates the transition from tentative experimentation to proactive curriculum integration. The personalisation of sustainability learning was particularly evident in Cardi's reflections. She explained that, at the outset, sustainability was "just a word" she was "learning to say." However, as the year progressed, it became something she felt "real passionate about," noting that ongoing engagement was essential: "One year of this is just not going to make it enough… This is something I need to do every year even if it is just some sort of refresher because the Kaupapa is very important." Cardi's evolving relationship with the Kaupapa demonstrates how PLD can foster both cognitive and emotional investment, embedding sustainability within teacher identity and discourse.

Access to practical resources and shared frameworks also played a crucial role in supporting evolving practice. Teacher participants frequently highlighted the importance of the resources shared during the SELCD PLD sessions, describing them as both useful and influential in reshaping their teaching. For example, Alicia reflected that she "had not thought about sustainability prior to the PLD" but now regularly used the sustainability frameworks and materials introduced during the sessions in her classroom. This integration of new conceptual tools (cultural-discursive arrangements) alongside tangible classroom resources (material-economic arrangements) demonstrates how PLD supported the translation of sustainability concepts into practice.

The picture book session was mentioned by Alicia, Beyoncé, and Mr. T as particularly beneficial to teaching sustainability, as the texts were meaningful, and encouraged connections to local issues. Mr. T expressed surprise at discovering so many sustainability-themed picture books, remarking,

“I’d never found books like that before.” He explained that the session gave him “a sense that I can integrate sustainability into my reading lessons,” demonstrating how exposure to new resources expanded his teaching possibilities. He also appreciated having the PLD materials curated and easily accessible, noting that, “it was like having someone go out and do my research form me.”

This purposeful structuring of resources, initially through Google Slides and later through a dedicated website, can be seen as an intentional reconfiguration of the material-economic arrangements to support sustained engagement beyond the PLD sessions. The website contained resources to support the integration of sustainability education in local curriculum design, particularly picture books linked to different SDGs as well as links to Aotearoa New Zealand organisations with resources and information supporting sustainability education. Having access to these resources when the team were ready to integrate sustainability into school planning templates was particularly appreciated by Rangi, indicating that sustainable change required more than just new ways of talking and relating (cultural-discursive and social-political), it also needed material conditions to enable practice.

The school’s planning journey was articulated throughout the individual interviews, particularly the influence of the SELCD PLD on future planning. Questions were raised as teacher participants pondered how the sustainability planning would work for them. Rangi explained that she had considered the planning aspect during each SELCD PLD session and contemplated how the learning would look in the school. For Rangi, the standout idea was viewing the curriculum through a sustainability lens. Reflecting in this, she said, “It’s not another area we have to teach; it ties everything together in a manageable way.” Thinking about the SELCD PLD, Rangi also wondered why there was not more PLD on sustainability education, given how clearly it connects with the refreshed New Zealand Curriculum, Te Mātaiaho (MoE, 2023).

Mr. T reflected that the SELCD PLD had provided clear steps to support planning and guide the school to becoming the kind of community they envisioned. He explained, “It’s helped us understand the steps we need to take to turn ourselves into the school we envision and the community we envision.” Beyoncé described her implementation of the PLD during the year as “trial and error,” but expressed excitement about beginning the next school year with a clearer sense of how to integrate sustainability into her planning. Cardi and Alicia, were also looking forward to future planning sessions and school-wide collaboration, with the whole team contributing ideas to explicitly teach sustainability concepts.

Theme 4: Fostering Continuous Learning in Sustainability Education: Integrating Local Resources and Expertise in SELCD

During individual interviews, teacher participants highlighted the importance of continuing their sustainability education journey. Seven of the teacher participants expressed a desire for ongoing PLD support to further integrate sustainability into their teaching practices. Alicia advocated for sustainability to be incorporated into planning, explaining that "now that we understand sustainability, we need to actually put it in our planning… having it in our long-term plans and everyone doing it will be a buzz for the whole school." Sam recommended a focused approach to planning, proposing concentrated days dedicated to specific aspects of teaching units instead of smaller, scattered meetings, noting that "it probably sticks more doing it as a whole day rather than little bits and pieces… you forget some if it otherwise." Seamus supported this idea, suggesting that "you might need a day where you're actually just looking at that," referring to integrating sustainability with planning templates and frameworks.

Cardi emphasised the importance of ongoing learning to embed sustainability into her practice and suggested one-on-one meetings for support, explaining that she valued direct feedback and opportunities to ask questions without feeling whakamā (shy). This sentiment was echoed by Alicia, Beyoncé, and Mariah, who expressed interest in observing modelled lessons to enhance their understanding of sustainability education. These teacher participants' thoughts affirmed Beyoncé and Seamus' comments from FG4, where they proposed the introduction of modelled sustainability lessons.

The focus on local curriculum was another key aspect from PLD that teacher participants, including Alicia, Mr. T, Mariah, and Beyoncé were eager to implement in the upcoming school year. Mariah explained how the PLD had, "opened her eyes to the world more" and given her a greater understanding of the local area and its significance. She was keen to know more about the stories behind the names of the whare (meeting houses) on the local marae so that she could pass that learning on to her students. She emphasised the importance of learning about where the landmarks surrounding the school, including statues, buildings, and factories that hold the history and significance of the area. Mr. T shared a similar view, saying, "I still think we could learn a lot more about our local environment…it would be really beneficial for the kids to look at the people in our community – the whānau, the whakapapa." Alicia also noted that the school leaders were supportive of local curriculum implementation, observing that, "our management and leaders are passionate about it… everyone's got a lot more of an understanding, so it makes it a lot easier." A Kaupapa had already been established for the beginning of the next school year, signalling a shared commitment to weaving local knowledge and community connections into teaching practice.

Cardi reflected on her developing confidence and goal of using the resources from the SELCD PLD purposefully in her personal planning. She admitted that, at first, she included activities simply because she enjoyed them but recognised the need for stronger links to learning outcomes, explaining that “moving forward we could possibly plan around our choice resources.” Now with greater understanding and passion for sustainability, she was eager to collaboratively plan across the junior hub, connecting learning areas through sustainability concepts. Mr. T highlighted the value of resources introduced during the PLD, particularly local organisations and council websites, which he found useful for designing community-focused learning experiences. He emphasised the importance of drawing on local expertise to “futureproof” education. Together, these reflections demonstrate teacher participants’ growing commitment to sustained support, collaborative learning, and meaningful integration of sustainability and local curriculum into practice.

Summary of CPAR Phase Two

Professional Learning Arrangements for Enabling SELCD

The data analysis from this phase of the research revealed that professional learning and development (PLD) in primary schools like the case study school needs to be regular, ongoing, and contextually responsive. Evaluation of the SELCD PLD highlighted the aspects that were uplifted by teacher participants and translated into classroom practice. The findings indicated a shift towards a more holistic understanding of sustainability and sustainability education. Teacher participants described how their understanding evolved from viewing sustainability as solely environmental concerns to recognising its interrelated social, cultural, and economic dimensions.

The data also uncovered the importance of exploring teaching approaches, resources, and frameworks to support effective practice. In particular, the head, heart, and hands (HHH) model had a transformative impact on teacher participants’ teaching practices. The model provided a framework for engaging students cognitively, emotionally, and behaviourally, helping to foster empathy and inspire action. However, it was not the model alone that empowered teachers, but the collective engagement, shared learning experiences, and collegial discussions within the PLD sessions that fostered a sense of agency. This reflects the social-political arrangements that enabled teacher participants to build confidence and ownership through collaboration and shared responsibility for sustainability education.

Teacher participants expressed enthusiasm for integrating sustainability into their curriculum planning. While formalised sustainability planning had not been adopted schoolwide, teacher participants were already incorporating SELCD concepts informally within their teaching. They also recognised the need to restructure material-economic, arrangements, such as time allocation and resource accessibility, to fully integrate these concepts into their curriculum planning. Additionally, the findings highlighted how social-political arrangements, including collaborative discussions and

shared leadership, empowered teacher participants to lead sustainability initiatives within their teaching teams.

Furthermore, the evaluation showed a strong desire for ongoing PLD support to continue integrating sustainability into teaching practice. This reflects a shift in cultural-discursive arrangements, as teacher participants moved beyond viewing sustainability as a stand-alone topic to understanding it as a cross-curricular lens. They emphasised the importance of continuous learning, collaboration, and drawing on local expertise and resources to enrich sustainability education.

These findings demonstrate how changes across the cultural-discursive, material-economic, and social-political arrangements collectively supported the development of sustainability education within the school. Figure 5 provides a summary of the key findings from this phase of the research.

Figure 5

CPAR Phase Two: Summary of Findings

- Intense and deliberate focus on holistic SE during PLD impacted teachers thinking, discussion and actions.
- Teachers had shifts in their thinking towards problem-solving and critical thinking.
- There was a recognition that the whole curriculum can be viewed through a sustainability lens, and can be integrated into every curriculum learning area.
- Tangible frameworks like the UNSDGs and HHH framework were recognised as supporting SELCD planning.
- The 'why' needs to be taught through heart learning so that students know the purpose of their learning.
- PLD discussions fuelled enthusiasm for exploring new possibilities in student learning.
- Time is needed to explore resources, reflect, plan collaboratively, create exemplar plans, and adjust timetables.
- The overwhelming amount of PLD in the school meant that many voices were feeding into learning and teaching ideas, and teachers were stretched to implement all the new learning.
- Anchoring learning within local contexts and sustainability allows students to actively engage with relevant issues.
- A clear Kaupapa was desired so that all teachers could plan and work towards the same goal.
- There are a lot of ideas and expertise in staff, and there is a desire for teachers to lead the learning.
- Future PLD could include modelled lessons as a starting point for sustainability learning.
- Time of day for PLD must be considered to maximise learning.

CHAPTER SIX

How SELCD PLD Shapes School Curriculum and Teaching Practices (Phase 3 Findings)

The previous chapter focused on evaluating sustainability professional learning and development (PLD) and synthesising how practice arrangements in the case study school might enable sustainability education and local curriculum design. Following the sustainability education and local curriculum design (SELCD) PLD sessions, the school year ended, concluding my time in the school. During the first term of the following year, the school was left to plan and deliver their learning independently. At the end of Term One, I returned to conduct the fifth and final focus group, consisting of eight teacher participants as part of CPAR Phase Three (see Figure 6).

Embedding Professional Learning and Development in Practice

Focus Group Five

In this chapter, attention shifts from the professional learning and development sessions to teaching and learning in the case study school. The aim of this third phase of the CPAR was to evaluate how PLD informs school curriculum and classroom practices from multiple perspectives. Although the focus group was intended to centre on teacher participants referencing, reflecting on, and discussing their planning documents, it proceeded without them, as participants preferred to recall experiences rather than use physical copies. Like the previous four focus groups, the discussion was analysed using a practice architectures framework (Kemmis, 2022; Kemmis et al., 2014b) to identify where SELCD PLD shaped local curriculum design and teaching practices. This framework enabled critical analysis of the interconnections between SELCD PLD and teacher participants' sayings, doings, and relatings within the school, making sense of the discourses, material-economic arrangements, and relationships influencing how SELCD PLD was transferred into planning and teaching.

The discussion provided insights into shaping the conditions and arrangements to support further SELCD PLD while identifying factors that enabled or constrained action and interaction. The analysis explored connections between practices and arrangements, categorised under the following themes: forms of understanding, modes of action, and ways of relating to each other and the world. Table 14 summarises the findings from Focus Group Five (FG5) using Kemmis' (2022) table of invention (p. 118).

Figure 6

CPAR Phases One, Two, and Three: Professional Learning Arrangements for Enabling Sustainability Education and Local Curriculum Design

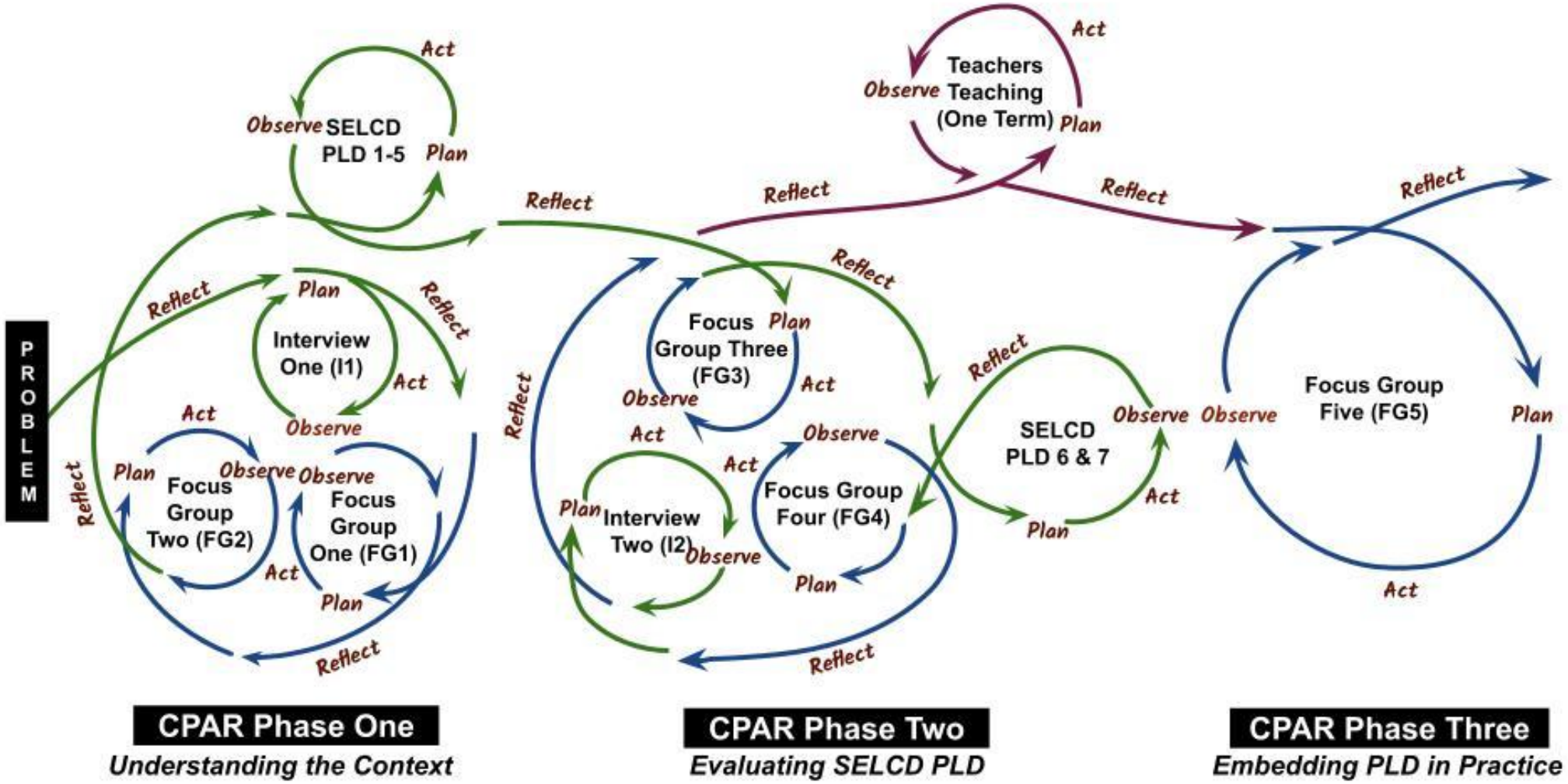


Table 14

FG5: Synopsis After One Term Teaching 28/03/23

Analysing the Entanglement Between One Practice and Another

The sayings, doings, and relatings of SELCD PLD and teaching become the practice architectures that shape the sayings, doings, and relatings of future SELCD teaching and PLD in SELCD.	
Sayings *Forms of understanding*	*Thinking and talking about the influence of SELCD PLD on planning and teaching become the cultural-discursive arrangements that shape ideas and thinking for future PLD and teaching.* • Learning about the local area and local stories is important, "Our kids don't know the significance of where they live". • Students are engaged and interested when learning is relevant to them and when it is deep.
Doings *Modes of action*	*Activities, work, and material arrangements of SELCD PLD and teaching become the material-economic arrangements that shape activities and work, and material arrangements of teaching SELCD PLD.* • The term Kaupapa, 'Ko (town name) Toku Tūrangawaewae' (Where we stand) provided opportunities for learning about the local area (stories, history, geography). • There has been a strong emphasis on hands on/ experiential learning throughout the school. • Flexible and adaptable teaching approaches have been driven by student curiosity and deep connection to the local area. • Environmental awareness and community involvement were prioritised.
Relatings *Ways of relating to each other and the world*	*Relationships of power and solidarity in SELCD PLD become the socio-political arrangements that shape relationships of power and solidarity in SELCD PLD.* • Collaboration among teachers is crucial for planning, idea-sharing, and problem-solving to create a local-focussed curriculum. • Student engagement in learning comes from meaningful local curriculum learning experiences. • Expertise sharing from resident expert, prioritising PLD, and sharing outcomes in hui (meetings) enhances teaching practices and outcomes.

Sayings: Forms of Understanding

Teacher participants' thinking and understanding of sustainability after a school term of planning and teaching were explored during Focus Group Five (FG5). The discussion centred on the Term One inquiry Kaupapa, 'Ko (town name) Tōku Tūrangawaewe' (Where we stand), which served as the school's social sciences focus. Teaching and learning during the term integrated environmental, social, and cultural aspects of sustainability within the local context. Much of the learning was grounded in local narratives and histories.

Ella, new to the school, shared her experience of teaching local stories and noted how “engaged the kids are in learning about the stories about where they live.” She explained that students generated thoughtful questions and indicated that there were discussions she hadn’t anticipated. For example, when reading a local story that included kete iwi (basket of people or a bag of bones) at the point in the story when the chief took the bones in a kete (carrying basket often woven from flax) to Raglan and put them in a cave, the students asked questions such as, “Where did they get the bones from?” “How did they get the bones?” and “How did they get them to Raglan?” These unexpected questions prompted Ella to reflect on how her teaching approach shaped students’ engagement with their learning. Ella recognised that the teaching methods used in class influenced how students interacted with the content. She described how acting out one of the local stories made it more meaningful for students than simply listening to it being read aloud. She explained, “they really got into it…and a couple of days later, they wanted to act it out again…and it’s just brought more meaning.”

Alicia described the positive influence SELCD PLD had in providing the “spark to her thinking about the local area and linking it to the curriculum. She explained that she “would never have actually sat and thought about it” or made the links to the local area prior to the SELCD PLD. Mariah agreed, reflecting how she had started to think more about the local area, and began researching in class, learning alongside her students because “I didn’t know the places around here or the significant statues…and the kids didn’t even know… so we all don’t know… we are going to learn.” Another positive aspect of local curriculum planning was the acknowledgement that students appear to be more engaged in learning when it is relevant to them and when it is deep. Alicia gave an example of her students being interested in what the awa (river) was used for in the past and in the present day. The students wanted to know more because of its prominent presence in the town and because they swam in it. They began to look at various uses of the awa (river) and how these had changed over time. The teacher participants understood the importance of students becoming aware of the significance of where they live and their local area as the place where they stand.

Alicia and Seamus identified the United Nations Sustainable Development Goals (SDGs) and the HHH model were central to their learning during the SELCD PLD. They emphasised how these frameworks informed their planning for the term, particularly around local area learning. Rangi explained how the team used Goodlife Goal 11: *Love Where you Live*, aligned with SDG 11: *Sustainable Cities and Communities* to structure their inquiry. The plan followed the HHH model: “Our head was having an understanding about significant local places: our hand was picking up the rubbish and creating signs about the places we focused on; and the heart was looking at the impact of locals using the awa (river), like pollution and pests on the awa (river).” She also shared that some students had emotional moments learning about the land wars connected to local sites, describing this as “a bit of a heart moment for them.” While the SDGs and HHH model were integrated into the term’s inquiry, Rangi believed the team could continue exploring these frameworks to strengthen

their understanding and ensure they were fully embedded in future planning, teaching, and learning. She reflected, “We tried to integrate them [SDGs] into our template for inquiry, but I think that would be somewhere to explore a lot further.”

The language of sustainability, introduced through the SELCD PLD, was beginning to shape the teacher participants’ discourse around local curriculum design. Rangi described how she and Fred noticed the ideas and planning concepts at the Aotearoa New Zealand Histories and New Zealand Curriculum Refresh PLD sessions aligned closely with the HHH model introduced during the SELCD PLD sessions. This alignment between multiple frameworks and professional learning experiences suggested a shift in cultural-discursive arrangements, as teacher participants developed a shared vocabulary for talking about sustainability in local curriculum planning. Rangi explained that their next steps would be to bring these frameworks together, noting, “That would be a direction that we are going in - how to sort of merge those together as we start to use the those [refreshed] curricula.”

Doings: Modes of Action

The interconnection between the sayings, doings, and relatings became clearer in the case study school during FG5. The teacher participants’ understanding, described in the preceding section, is linked to the doings section and modes of action reported in this part of the chapter. The Term One Kaupapa, ‘Ko (town name) Toku Tūrangawaewae’ (Where we stand), provided opportunities for learning about the local area (stories, history, geography). Teacher participants planned learning around their local awa (river) which included a lot of curriculum integration and was based around the local story of how the town came to be named. Using a local cultural narrative to springboard into learning supported teacher participants to plan learning related to the students, the school, and the local community.

The school placed a strong emphasis on hands-on, experiential learning with a clear focus on community engagement. In their inquiry units, students explored te awa (the local river), studying its environmental issues such as pollutants and pests, and considering how they could take meaningful action. Teacher participants and students took part in a hikoi (walk) to clean up the river, followed by the creation of informational signs to educate the community about the significance of local places. The project also explored historical contexts, such as the river’s role in past land wars. The integration of environmental awareness, cultural understanding, and community involvement was evident in the learning experiences, demonstrating a commitment to making the learning process both educational and impactful for students and the local community.

There was general agreement among the teacher participants that teaching does not always follow the plan. Flexible, and adaptable teaching approaches were often driven by student curiosity and deep connections to the local area. Ella and Alicia both explained how they usually began with a plan, but learning often went in unexpected directions due to student interest. As Ella described,

“Sometimes too, like you start, like you plan it, but then when you get into the classroom it actually goes off in a different direction.” This emergent approach to teaching reflects the temporal arrangements of practice, where the rhythm and sequence of learning are co-constructed rather than predetermined. Alicia noted the importance of setting clear “targets” within planning, explaining that otherwise, “time does kind of go and you’re like, holy heck, it’s week nine and I haven’t even done much.” Rather than following a fixed sequence of lessons, learning unfolded dynamically in response to students’ inquiries and experiences.

Rangi explained that the school continued to use the Kaupapa overview plan, which the team developed collaboratively at the beginning of the term: “We do the Kaupapa plan in one go, and we’re about to do the same thing again.” She acknowledged, however, that the team often reached the end of the term and realised they hadn’t achieved everything initially intended. “We’re looking to change it so we don’t just stop at the big overview but actually nut out what every week is going to look like.” Both Rangi and Alicia recognised the need for more detailed weekly planning to support teaching and learning, transforming planning into a living, working document rather than a static outline completed at the start of the term.

Time was the main limitation Beyoncé and Alicia mentioned when planning their sustainability units; not just as a shortage, but as a structured arrangement influencing what was possible within the teaching day. Alicia noted, “We were out of class a heck of a lot this term”, referring to extracurricular commitments, strike action, whānau day, school closures due to weather, PLD days, and the daily Developing Mathematical Inquiry Communities (DMIC) mathematics lessons. These temporal structures shaped what learning could take place and when, highlighting the influence of time-space arrangements on curriculum design. Reflecting on this, Alicia recognised that more learning could be integrated across the day, suggesting that apart from mathematics, “everything else could be Kaupapa all day… everything I do could link.” Her reflection demonstrated the potential for deeper curriculum integration if time were used more fluidly, allowing for greater continuity between planned and emergent learning experiences.

Relatings: Ways of Relating to Each Other and the World

Throughout the focus group discussion, teacher participants not only described the engagement of students in Kaupapa learning but also expressed their own level of involvement and enjoyment in the teaching and learning process. While teacher participants’ feelings and experiences are subjective, their use of positive language throughout FG5 reflects their individual perceptions and interpretations of their sustainability teaching experiences. The frequent use of words such as “awesome” by Alicia and “cool” by Mariah, Alicia, and Ella not only reflects their sayings but also conveys their emotional connection to PLD and their evolving professional identity as sustainability educators. The positive language used to describe the term’s Kaupapa learning suggests that teacher participants perceived their work as meaningful and impactful, contributing positively to their students’ learning while also deepening their own sense of purpose and engagement.

Alicia explained that facilitating students' visits to the local marae and awa (river), and involving them in being part of the community, provided "really rich learning" experiences. She reflected, "It was awesome to get our tamariki on the marae, on the awa, and actually be part of our community… even our kids that came and spectated, it was just awesome to see them involved." Alicia expressed how this approach strengthened connections between students, whānau (family), and place, reinforcing classroom learning about the awa through lived experience. Teacher participants recognised that student engagement in learning stemmed from meaningful local curriculum experiences. Seamus explained that success to him was, "how the children get engaged" in their learning.

To foster these meaningful learning opportunities, the teacher participants collaborated more closely. Collectively, the team recognised the crucial role of their planning meetings as important forums for sharing ideas and co-creating a locally focused curriculum aligned with their vision for learning. Alicia reflected, "This year we have collaborated a lot more, sharing more ideas, which has been really good." While scheduling specific times remained a barrier, Rangi explained that collaborative planning had been a work in progress over the years. The school had moved away from a model where each teacher was responsible for one curriculum area shared with the whole staff. Instead, the team planned the term's Kaupapa overview together. Ella expressed her appreciation of the team, noting, "You feel like you've got someone that you can always go to," highlighting the sense of support and shared learning, particularly around understanding the local area and pronunciation of te reo Māori. Cardi described the term's planning as, "similar, but at different levels," explaining that the Kaupapa overview provided a shared goal while allowing flexibility in classroom planning. Rangi suggested prioritising sustainability and curriculum design during team meetings so teacher participants could share outcomes and resources rather than store them individually. The team also discussed adding more detail to the planning overview, such as a weekly focus, to further support teaching and learning.

Furthermore, teacher participants acknowledged the importance of sharing expertise among the team and drawing on community experts to support learning. Beyoncé appreciated having Cardi, a resident expert from the local area, working in the same hub within the school. "It has been good having Cardi down in the hub because she is from here. When me and Ella have questions, we can go to Cardi - 'duh, duh, duh, duh, What does this mean?' and, if she doesn't know, I will go and ask this person." She valued being able to turn to Cardi for clarification about the local area or to be directed to someone who could help.

During the focus group discussion about future planning, Seamus built on another participant's interest by suggesting collaboration with a local expert skilled in seed gathering and native plant

propagation; “there’s this local fella just over the river… he’s got a nice nursery and does natives.” His suggestion illustrated how community expertise could enrich teaching and provide authentic learning experiences for students. Rangi responded enthusiastically, emphasising, “connections with people” as vital to the school’s learning approach. Both Seamus and Rangi’s kōrero highlighted the importance of drawing on local knowledge, community relationships, and shared expertise to support students’ understanding of sustainability and place-based learning. Rangi also noted that future PLD should continue to strengthen these community connections by including locally relevant content that aligns with the school’s curriculum goals.

Tables 15, 16, and 17 map the interconnections between different aspects of practice architectures and teacher’s practices. These tables provide an overview the four data collection stages, illustrating changes in teacher participants’ sayings, doings, and relatings over time. The tables demonstrate how these changes were either enabled or constrained by the cultural-discursive, material-economic, and social-political arrangements present at the school site or introduced through the SELCD PLD and other concurrent professional development initiatives.

Table 15

Synopsis of Learning: Coming to Practice Differently – Situated in how PLD is Arranged to Enable Sustainability Practices to be Developed

How is PLD 'Stirred' into Practices? (Forms of Understanding)

T1 FG2: Data from FG1 + Int One 07/07/22 *T2 FG3: After five PLD sessions 28/10/22*	*T3 FG4: After seven PLD sessions 5/12/22* *T4 FG5: After one term teaching 28/3/23*
Practices	Practice architectures
Sayings **From (T1)** *PLD is seen as an opportunity for growth and need to develop a common understanding of sustainability, SE and SELCD, as well as link to local community and local issues, nurture individuals and focus on life skills rather than solely on academic targets.*	**Cultural-discursive arrangements** **From (T1)** *Must link PLD to local area and connect with community to cultivate local identity, sustainability, and life skills through connection to local culture, identity, and the environment.*
To (T2) *Teacher participants are enthusiastic about incorporating sustainability and problem-solving into education. Changing teacher talk to encourage students to explore and understand 'why' behind their actions, adopting HHH approach to make SE more accessible and engaging for students.*	**To (T2)** *Equip teachers with tools and knowledge to integrate sustainability concepts seamlessly into classrooms, cater to teacher's needs by providing PLD focussed sessions that cover a range of valuable resources, ready-made lesson plans, innovative ideas, etc.*
To (T3) *PLD resources were effective in promoting sustainability in the school community. Using tools like the SDG frameworks and digital maps of marae, the school can deepen its understanding of local history and culture, creating meaningful connections to the area. By taking localised action and using the frameworks, resources, the school can empower its community to foster and cultivate a culture of sustainability.*	**To (T3)** *PLD promoted integration of SE into school curriculum while providing practical resources to support teachers. To integrate SE, the team will develop and share SELCD lesson plans that align with LC and current practices, gradually implement changes, recognising time required for transitions to a new way of planning without overwhelming the teaching team. Teachers expressed a desire for more guidance, modelled lessons, and step-by-step guidance on integrating SE.*
To (T4) *Local narratives, especially those centred around the river became the foundation for SE. Incorporating varied engagement methods and HHH learning significantly fostered a holistic understanding, however, the persistent challenge remains in consistently prioritising the Term's Kaupapa across all aspects of learning and teaching.*	**To (T4)** *The school's theme, 'Kō (town name) Tōku Tūrangawaewae' guided a comprehensive social sciences inquiry approach for both junior and senior hubs. The synthesis of ideas from professional development sessions, focus groups, and curriculum meetings shaped the direction for teaching and learning. While integrating HHH learning principles into planning, the overwhelming influx of additional PLD, covering various learning and teaching topics posed challenges for teacher participants in effectively transferring these learnings into the classroom.*

Table 16

Synopsis of Learning: Coming to Practice Differently – Situated in how PLD is Arranged to Enable Sustainability Practices to be Developed

How is PLD 'Stirred' into Practices? (Modes of Action)

T1 FG2: Data from FG1 + Int One 07/07/22 *T2 FG3: After five PLD sessions 28/10/22*	*T3 FG4: After seven PLD sessions 5/12/22* *T4 FG5: After one term teaching 28/3/23*
Practices	Practice Architectures
Doings **From (T1)** *Hands-on practical learning: modelling and doing, experiential learning where teachers are actively engaged through hands-on practical activities is important during PLD, rather than passive listening/ telling.*	**Material-economic arrangements** **From (T1)** *Flexible approach to sustainability professional learning sessions, design sessions to bring clarity through comprehensive frequent sessions.*
To (T2) *PLD resources provide immediate practicality and encourage students to explore sustainability topics in more depth through meaningful conversations, explorations and problem-solving. Able to use resources right away to tackle real-world problems.*	**To (T2)** *Time and support to engage in strategic planning and successful sustainability integration, acknowledging challenges of limited timetables, disruptions caused by Covid-19 and growing class sizes. To avoid overload PLD should be broken down into frequent, shorter sessions.*
To (T3) *Integration of SE frameworks and resources can emphasise SE learning. Planning and resource building are essential to create a comprehensive learning journey across the school, breaking down units of work into manageable segments with resources provided week to week. The involvement of the junior school students in waste management highlights the practicality/ action component of SELCD.*	**To (T3)** *Teachers recognise the importance of time to establish meaningful learning/ connections through the integration of PLD into practice. The importance of ongoing planning discussions, new planning templates, timing, and structure of PLD sessions is recognised with a range of options suggested for consideration Integrating HHH framework into school planning is evolving and a priority. Ultimately, decision making sits with the school principal.*
To (T4) *Teaching practices integrate local culture, environmental exploration, and interdisciplinary learning. Despite time constraints, flexible approaches adapt to classroom needs fostering curiosity and community-based learning. Emphasis on sustainability and local engagement links learning to real-world actions, though deeper explorations and resource allocation are needed. Efforts to integrate local knowledge into practical actions, such as developing information signs for the community require navigating permissions. Structured, detailed planning is necessary to explore themes more deeply and link between NZC learning areas for comprehensive learning.*	**To (T4)** *The school's dynamic approach to their themed learning/ Kaupapa, reflected in, 'Kō (town name) Tōku Tūrangawaewae' and the upcoming Matariki focus explores self, community, and cultural narratives in spatial contexts. However, interruptions to learning, timetable constraints and the dominance of DMIC hinder seamless Kaupapa (thematic) integration. Professional learning, though enriching, faces challenges in replication due to time and resource limitations. A call for hands-on, community driven, goal-oriented approaches, advocating for flexibility and collaboration to align with the thematic focus while reevaluating rigid timetable structures.*

Table 17

Synopsis of learning: Coming to Practice Differently – Situated in how PLD is Arranged to Enable Sustainability Practices to be Developed

How is PLD 'Stirred' into Practices? (Ways of Relating to Each Other and the World)

T1 FG2: Data from FG1 + Int One 07/07/22 *T2 FG3: After five PLD sessions 28/10/22*	*T3 FG4: After seven PLD sessions 5/12/22* *T4 FG5: After one term teaching 28/3/23*
Practices	Practice Architectures
Relatings **From (T1)** *PLD together is more meaningful and powerful if everyone sees the value in the PLD experience. By engaging in the learning process as a team a strong foundation will be created for mutual support.*	**Socio-political arrangements** **From (T1)** *Collective participation and collaboration are essential for effective, sustainable PLD. Learning together supports the journey and empowers everyone to contribute to the vision, giving each participant a voice and ownership in shaping the curriculum.*
To (T2) *The team worked together towards a shared vision and clear integrated Kaupapa-based approach. Sharing of ideas was promoted, and staff collaboration in PLD was recognised as powerful when it leads to actionable outcomes. Immediate action from PLD insights can foster a positive atmosphere for planning and exploring possibilities with students.*	**To (T2)** *Challenges faced due to Covid-19 meant meeting the needs of people first, ensuring wellbeing of students and staff before learning. Emphasis is now on starting afresh, building a supportive and collaborative learning environment through involvement of the team in generating ideas and setting priorities.*
To (T3) *PLD and collaborative learning has helped pave the way for increased teamwork moving forward. The team created a supportive environment in which they encouraged mutual learning. The PLD facilitation style, resources, and knowledge were well received and SELCD PLD sessions have been a vehicle for professional growth as the team engaged in collective learning experiences.*	**To (T3)** *Concept of committing to SELCD embraced by teachers. Practices of SE have been facilitated by engaging in SELCD PLD together, creating a shared purpose. An increase in teamwork and collaboration is expected in the upcoming year. The weekly planning process will evolve to ensure alignment and connection to overarching termly plan and Kaupapa.*
To (T4) *The teacher participants' exploration emphasised connection to local narratives and the environment, fostering hands-on learning experiences. Engaging with local community through marae visits and a focus on the local river strengthens student involvement. While professional learning sparks a localised curriculum focus, the need to balance dominant teaching methods necessitates reconsideration. Collaborative problem-solving and shared insights empower teachers, encouraging a collective and meaningful approach to exploring their interconnectedness with each other and the world.*	**To (T4)** *Thematic planning with a specific Kaupapa evolved from individual to collective team efforts, aiming to strengthen connections within the community. Gaining whānau support for events like regattas remains a challenge, prompting a need to understand barriers and references. Prioritising and sharing the implementation of professional learning among teachers is crucial, requiring organised team meetings to ensure SELCD is embedded into teaching practices.*

Summary of CPAR Phase Three

Embedding SELCD PLD in Curriculum and Teaching Practice

Data analysis highlighted the importance of PLD that is connected to the school's local context. For SELCD PLD to meaningfully influence classroom planning, it must be localised, relevant, and responsive to the specific community. In this study, 'bespoke' PLD helped teachers identify starting points for learning about their local area, informing their curriculum planning. Teacher participants noted that students engaged well when learning about their community and attributed their own growing awareness and confidence in local curriculum design to the SELCD PLD. Teaching during the term integrated environmental, social, and cultural aspects of sustainability within the local context. Using local narratives and histories as a 'springboard' into learning helped teachers to meaningfully connect curriculum content with students' lives, the school, and wider community.

Frameworks such as the UNSDGs and the 'head, heart, and hands' model supported teacher participants in their thinking and planning, while hands-on and experiential learning approaches engaged students with the Kaupapa. Teaching practices were often driven by student curiosity and connection to the local environment. However, the team recognised the need for more detailed weekly planning to better support learning, ensuring planning documents became active working tools rather than broad overviews. Future professional learning was identified as critical for continuing the school's curriculum design journey. Teacher participants emphasised the importance of drawing on both in-school and community experts to grow their knowledge of the local area and strengthen community connections. A summary of findings from Phase Three is provided in Figure 7 on the following page.

The collaborative nature of curriculum planning and teaching was a significant factor in translating SELCD PLD into practice. Teacher participants described how co-constructing the term's Kaupapa overview developed a stronger sense of ownership and coherence across the school. This collaboration extended beyond the staffroom, as teachers connected more intentionally with community members, including the local marae, and local experts. Relational practices between colleagues, students, and the community were central to meaningful curriculum design. The team recognised the value of sustaining these relational and collaborative practices and targeted PLD as they continued embedding sustainability education and local curriculum into the school culture.

Figure 7

CPAR Phase Three: Summary of Findings

- Teachers believed their students were engaged when they learnt about stories from where they live, when the learning was relevant and deep.
- SELCD PLD sparked thinking about the local area and how localised learning could link to the New Zealand Curriculum
- Frameworks such as the UNSDGs and HHH supported local area learning and planning.
- Using a local cultural narrative to springboard into learning supported teachers to plan learning related to the students, the school, and the local community.
- Hand's-on learning and experiential learning supported student engagement in the Kaupapa.
- Flexible and adaptable teaching approaches were driven by student curiosity and deep connection to the local area.
- More detailed weekly planning is needed to support teaching and learning so it becomes a working document rather than an overview of learning.
- Time remains a limitation, lack of teaching time due to other school events and activities.
- Teachers expressed a level of enthusiasm and enjoyment in the SELCD teaching and learning process as they found it meaningful and impactful, with students understanding how they could contribute to the sustainability of the local area.
- Involving students in the community provided rich learning experiences.
- ·Collaboration among teachers is crucial for planning, idea-sharing, and problem-solving to create a local-focussed curriculum and needs to be prioritised.
- Teachers acknowledged the importance of sharing expertise among the team and drawing on expertise from the community.
- Future PLD is seen as being important to support the school's local curriculum design.

Bringing the CPAR Phases Together

The conclusion of the third CPAR phase marks the end of the collaborative inquiry and the process of data collection and analysis. Each cycle built upon the insights of the previous one, progressively deepening both practice and understanding. While each phase revealed distinct challenges and opportunities, several themes emerged across the research.

In CPAR Phase One, the focus was on understanding the context. This included identifying the need for a shared definition of sustainability and sustainability education, understanding the teacher participants PLD requirements, exploring ways to support community engagement, recognising the influence of Enviroschools professional development, and developing an appreciation of the interwoven nature of learning and teaching practices.

CPAR Phase Two saw a reframing of understanding around sustainability through SELCD PLD. Resources such as the UNSDGS (UNESCO, 2017) and the 'head, heart, and hands' model (Singleton, 2015) supported teacher participants to transform their planning and pedagogy, and local resources became central to sustaining professional learning through the SELCD PLD. Phase Two

concluded with an evaluation of the SELCD PLD with recommendations for continued PLD. In the final phase, CPAR Phase Three, teachers embedded their professional learning into classroom practice, observing changes not only in their teaching but also in their collaborative approaches.

Together, these insights across the three phases of research provide a rich foundation for further reflection. Tables 15, 16, and 17 present a synopsis of how teacher participants' practices evolved across the four data collection points, organised within the practice architectures framework. The red double-headed arrows in these tables illustrate the reciprocal relationship between practice architectures and actual practices. The following chapter places these findings in conversation with the literature, highlighting their theoretical and practical implications within the broader educational context.

CHAPTER SEVEN

Discussion of Findings

This critical participatory research action (CPAR) project was conducted in three phases to address the overarching research question: *How can professional learning and development support primary school teachers in Aotearoa New Zealand to integrate sustainability education into their teaching practice and local curriculum design?* Each phase of the study examined a specific aspect of this question, informing the action research cycles within that phase and collectively contributing to the overall research aim.

The findings from each phase are presented in the previous chapters: Phase One in Chapter Four, Phase Two in Chapter Five, and Phase Three in Chapter Six. This chapter brings these findings together in two parts. Part One situates the findings within the framework of the theory of practice architectures (TPA) and its three interrelated practice arrangements: cultural-discursive, material-economic, and social-political. Part Two conceptualises sustainability education metaphorically as a flower, offering a lens through which to understand how school practice arrangements, curriculum design, and teaching practices intertwine. The theory of practice architectures highlights the complex interplay between these elements, guiding the design of bespoke sustainability and local curriculum design professional learning and development (SELCD PLD) and shaping the structure of this discussion, which is organised into two parts to examine their influence of these practice arrangements on the PLD process and outcomes.

Part One

Practice Architectures and their Impact on Teaching Practice

In schools, sustainability education is shaped by practice architectures: the cultural-discursive, material-economic, and social-political arrangements that enable or constrain teaching. The following discussion examines how these arrangements determine teachers' sayings, doings, and relatings, shaping what becomes possible in practice.

As highlighted in the findings chapters, the case study school's practice arrangements significantly influenced teacher participants' work. These influences were evident across their sayings, doings, and relatings, as summarised in Tables 7, 8, and10. The discussion that follows explores how these arrangements evolved over time, with the nature of this transformation captured in Tables 18, 20, and 21.

Kemmis and Mutton (2012) describe how practice architectures establish the conditions in which teaching unfolds, influencing how teachers conduct their work. The framework also provides a

conceptual tool for examining these conditions. Through this lens, the chapter analyses how evolving practice arrangements were shaped and through the SELCD PLD. The following three sections unpack each arrangement in turn, examining their collective impact on teachers' professional learning and classroom practice.

Section One: Cultural-discursive Arrangements - Shaping Meanings

The first phase of the research explored how teacher participants understood sustainability and identified their teacher professional learning and development (PLD) needs. A strong desire emerged for PLD that connected with the local area and community. Teachers aimed to foster local identity, sustainability, and life skills through meaningful connections to culture, place, and environment.

A similar approach was taken by Mana College through a Ministry of Education initiative that developed a place-responsive curriculum to help students make meaningful connections with their "own context and lives" (Picken & Anderton, 2020 p. 9). This emphasis on local relevance aligns with sustainability education literature, which advocates engaging students with complex local, global, and intercultural issues to cultivate compassionate and critical thinkers who engage in purposeful, authentic learning (Bolstad, 2020a; Bolstad & Gilbert, 2012; Eames et al., 2010). Embedding these principles required attention to the school's cultural-discursive arrangements, the language, concepts, and ideas introduced and negotiated through the PLD process. Through these arrangements, teachers' evolving understandings of sustainability began to surface, revealing both opportunities and challenges for curriculum design.

Challenges in Understanding Sustainability

Within the case study school, teachers' understandings were influenced by their engagement with Enviroschools, which provided a foundational framework. However, data analysis revealed that participants held varied and often fragmented understandings of sustainability. Findings from the CPAR Phase One suggest that many initially viewed sustainability in narrow terms, often as a set of environmental actions or future-oriented ideals. This pattern reflects broader literature describing sustainability as an ambiguous and contested concept (Jickling, 1992; Wals & Lenglet, 2016), encompassing multiple definitions shaped by diverse social and economic perspectives and represented inconsistently in public discourse.

Teacher participants expressed two dominant views about sustainability. The majority viewed sustainability as an ongoing process concerned with the future, while others associated it primarily with environmental preservation. Further discussion revealed that local features such as the river, native bush, cultural significance, and local history were central to how teachers made sense of sustainability. Despite these concerns, many sought greater clarity on its underlying principles and

relevance for education. This finding aligns with Bolstad et al. (2015), who observed that comprehensive understandings of sustainability remain elusive among educators.

To embed sustainability education effectively, the complexity of the concept of needed to be addressed in the PLD. Sessions involved critical examination of multiple definitions and conceptual models, helping teacher participants co-construct a shared understanding. Ultimately, they adopted Santander University's interpretation of the United Nations definition: "fulfilling the needs of current generations without compromising the needs of future generations, while ensuring a balance between economic growth, environmental care, and social well-being" (Santander Open Academy, 2022, para. 3). This holistic framing, supported by a visual model (Figure 9) from Te Kete Ipurangi (MoE, 2022b) and Tāhūrangi (MoE, 2024), illustrates four interconnected aspects of sustainability: environmental, social, economic, and cultural. The diagram resonated strongly with teacher participants, emphasising interdependence and aligning with their aspirations for local curriculum development.

Using this framework throughout the SELCD PLD sessions enabled teacher participants to organise their thinking around sustainability. Each aspect of the model became the focus of a dedicated PLD session, allowing a more in-depth exploration if its relevance to local, national, and global contexts.

Figure 8

The Four Interdependent Aspects of Sustainability

Note. Retrieved from. Copyright 2024 by the New Zealand Ministry of Education.

Building on this shared conceptual foundation, the next step involved translating this into practice by integrating shared values into the SELCD PLD. This phase moved beyond aligning educational practices to authentically reflect what mattered most to the teachers. Emphasising local identity, cultural significance, and community engagement demonstrated how deeply rooted values shape teacher participants' understanding and commitment to sustainability (Horcea-Milcu, 2022; Horcea-Milcu et al., 2023; Pacis & VanWynsberghe, 2020; Singleton, 2015).

Harré's (2018) values exercise became a pivotal tool for reflection, offering a framework for teacher participants to articulate their most deeply held beliefs. This process was not simply an exercise in consensus but a transformative step toward collective ownership of an educational vision, a process also recognised by Singleton (2015). The team was not simply rethinking curriculum in abstract terms but reimagining it in ways that were meaningful and consistent with their lived experiences. This dialogue, inspired by Harré's *The Infinite Game* (2018), extended beyond initial reflection to ongoing conversations about how shared values could guide the future direction of SELCD. Core values, such as respect for the environment, social responsibility, and cultural heritage, demonstrated the importance of grounding curriculum design in principles understood and shared by both educators and their community.

Incorporating these values allowed the PLD sessions to move beyond the theoretical discussions of sustainability. They became spaces where teacher participants internalised sustainability on a personal level, leading to more authentic and locally relevant curriculum design. This process empowered teacher participants not only to understand sustainability as a concept but to live it in their planning and teaching. By focusing on what mattered most to them, the team ensured that sustainability education remained dynamic, relevant, and rooted in both human and ecological flourishing. This values-based approach aligns with a holistic view of sustainability encompassing learning across cognitive, affective, and behavioural domains (Osman et al., 2017; UNESCO, 2017). Fien (1993a) similarly emphasises that education *for* the environment carries a clear values-based agenda aimed at social change, while Warden (2022) acknowledges the influence of values on a place-based nature pedagogy that grounds learning in local contexts. Integrating values into sustainability education is widely recognised as a critical component of transformative learning, fostering justice, equity, and respect for nature as guiding principles for meaningful change (Horcea-Milcu, 2022; Horcea-Milcu et al., 2023; Pacis & VanWynsberghe, 2020; Singleton, 2015).

The deliberate focus on defining sustainability and identifying shared values through activities such as critically engaging with multiple definitions and using Harré's (2018) values exercise was instrumental in building a cohesive understanding of sustainability among teacher participants. These activities directly addressed the initial challenge of varied and disconnected interpretations. More than clarifying abstract concepts, the values-led process grounded learning in what mattered

most to participants: nurturing a stronger sense of place, community, and purpose through teaching. Feedback throughout the SELCD PLD process made it clear that any model of sustainability education must be both theoretically sound and personally relevant. By linking sustainability to the cultural narratives and shared values of their school community, teacher participants developed a sense of ownership and empowerment in designing curriculum. In this way, PLD not only aligned with their aspirations but strengthened their commitment to a curriculum that reflects and serves its people and place. This alignment highlights the critical role of local context in educational transformation, ensuring that sustainability education is not only embedded in curriculum design but also lived out in the daily practice of teaching and learning.

Connecting Curriculum to Place: A Localised Approach

For sustainability education to be effective, linking it to local curriculum is essential for teachers and schools (Bagnall, 2016; Bolstad et al., 2015; MoE, 2018; UNESCO, 2017). In this research, teacher participants' desire to link the SELCD PLD to the local community meant that the language and ideas introduced through the PLD had to be contextually relevant and specific to the area and school context. My main role as the PLD facilitator, was to build teacher participants' capability in understanding the breadth and depth of sustainability education and to support them in designing rich learning experiences within their local context, learning with and from their local community.

While sustainability issues are both local and global, the SELCD PLD primarily focused on local challenges related to sustainability. This emphasis aligned with the New Zealand Ministry of Education's (MoE, 2020b) Term Three priorities for local curriculum, reinforcing the integration of sustainability education into school-based curriculum design. This alignment supported teacher participants' aspirations to link learning to their local area and engage with the community through connections to local culture, identity, and the environment. Such an approach reflects a broader educational shift towards living responsibly within our 'common home' (Berryman & Sauvé, 2016; Cloud, 2009; Lotz-Sisitka, 2017; Pope Francis, 2015). Understanding and teaching how everyday actions influence interconnected systems at all levels, from local to global, enhances educators' and learners' capacity to reimagine "healthy communities" (McFadyen & Benade, 2021, p. 14).

Positioning curriculum localisation as a central element of the PLD was crucial in helping teacher participants understand *what* and *how* to teach sustainability. Wagle (2023) contributes to this discussion by framing local curriculum through an ecological worldview that emphasises the interconnectedness and interdependence of all beings, an approach that complements the focus on community values and sustainability. This approach aligns with the Ministry of Education [MoE] stance that learning should occur *with* and *from* the community. According to MoE (2019b), engaging in rich opportunities *with* the community helps ākonga (students) view it as a system with social, cultural, political, and economic dimensions, apply their learning in authentic contexts, and

experience a sense of belonging. Such engagement allows students to learn from respected role models, be recognised for their contributions, and connect learning to real-life experiences. In this way, learning extends beyond the classroom and becomes embedded in community life.

Two of the nine high-impact practices identified in MoE PLD priorities were particularly relevant to the localisation in the SELCD PLD: designing curriculum that align reflects local community values and interests and situating curriculum within broader societal issues and future trends (Hipkins & McDowell, 2020). Initial interviews revealed that while many teacher participants understood why sustainability education mattered, they were less confident in *what* and *how* to teach. Some connected sustainability to lifelong learning, while others referred to ideas such as kaitiaki (guardianship) and protection of what is valued. Localising the curriculum therefore became a key focus of the PLD, addressing limited conceptual understanding and strengthening teachers' ability to connect sustainability with local culture and community. For this to succeed, the PLD needed to be anchored in the sustainability of the local environment, culture, economics, and social wellbeing. As the facilitator, I needed to be well-versed in the sustainability issues specific to the area in order to guide teacher participants in reviewing community relationships, identifying the challenges, and exploring available resources (MoE, 2019a).

Localisation in this sense aligns with Rush's (2022) second definition, derived from interviews with school principals, which describes localisation as adapting national curriculum goals to reflect local contexts, making the curriculum "different" from school to school. This approach enables students to engage with local issues, offering a sense of agency and hope for the future through community participation (Strazds, 2019). As a form of place-based learning, localisation can take place anywhere the learning context is most relevant: on the Marae, in natural environments such as the bush or river, or in community spaces such as museums (MoE, 2019a). This flexibility highlights the adaptability of curriculum design to meet the needs of particular locations.

The importance of place-based education is emphasised by Penetito (2016), who, in a discussion of Māori history in the New Zealand curriculum, urges educators to "begin where your feet are," encouraging curriculum design to start with local contexts before expanding outward. His advocacy for grounding learning in students' immediate environments supports the idea that meaningful education emerges from a deep connection to place, a view also shared by McFadyen and Benade (2021). Penetito (2009) further reinforces this by showing how place-based approaches strengthen relationships among learners, communities, and cultural identities.

Gruenewald's (2008) concept of a "critical pedagogy of place" complements this perspective, encouraging educators to consider how their teaching influences the places students inhabit and the legacies they create (p. 3). Similarly, Mannion et al. (2013) expand on this idea through their theory

of place-responsive pedagogy, which deepens human-environment relationships and fosters reciprocal connections between people and place. These frameworks are particularly relevant to sustainability education, where integrating local environmental and cultural knowledge ensures that curriculum content is not only relevant but also empowers students to engage critically with sustainability challenges in their own communities.

Integration local sustainability issues into the PLD provided teacher participants with a meaningful framework for exploring sustainability in their own area. Building teacher participants' confidence and knowledge of their local *place* using resources such as local environmental data from the local busy and river ecosystems proved essential. This reflects a growing recognition in Aotearoa New Zealand of the role of schools and teachers in designing curriculum to reflect what matters to their community (MoE, 2019a, 2020a, 2021).

Drawing on diverse local sources, including community noticeboards, district council websites, and local organisations like the local Lions Club, provided valuable insights into community concerns. Issues identified, such as urban design, mana whenua values, public safety, and waste management demonstrate the interconnection of environmental, cultural, and social dimensions within the local context. Designing the SELCD PLD around these issues affirmed Block et al.'s (2016) argument that community restoration through localisation fosters collective action for the common good, contrasting with individualistic approaches, a view echoed by others advocating for relational and transformative approaches to sustainability education (Jickling & Sterling, 2017; Weil, 2016).Having explored how sustainability education is informed by local contexts and community challenges, the next step is recognising how Mātauranga Māori enriches this process through Indigenous ways of knowing and being.

Integrating Mātauranga Māori with Sustainability and Local Curriculum

Any localisation of curriculum requires consideration of the connections between people and place. Thoughtfully integrating Indigenous perspectives is therefore essential when exploring place. In Aotearoa New Zealand, this is particularly relevant given that 90% of Māori learners are enrolled in mainstream education (Glassey et al., 2023). Research identifies Mātauranga Māori (traditional Māori knowledge), tikanga Māori (Māori customs and traditional values), and Te Ao Māori (the Māori worldview) as vital for sustaining Māori identity within education (Durie, 2003; Glassey et al., 2023; Macfarlane, 2015; Mead, 2016). Likewise, Education for Sustainability (EfS) research emphasises learning with and from living systems; ecosystems and networks that sustain environmental, cultural, and social wellbeing (Bonnett, 2017; McCaw, 2022; Ritchie et al., 2015).

Findings from this research highlighted the importance of integrating Mātauranga Māori, though teacher participants were often uncertain of how to proceed. Despite this uncertainty, they

recognised the significance of the local area for tangata whenua (the Māori iwi or hapū who have customary authority over a place). Their desire to incorporate Mātauranga Māori aligns with Penetito (2009), who advocates including Indigenous perspectives in educational settings to enhance cultural relevance and sustainability. This approach also reinforces a holistic view of sustainability encompassing social, cultural, environmental, and economic dimensions.

To address the challenge of integration, the He Awa Whiria (braided river) concept offered a productive framework. Macfarlane et al. (2024) describe this metaphor as weaving knowledge systems together, allowing Indigenous and Western perspectives to flow alongside one another while maintaining their distinct integrity. Within the SELCD PLD, this approach encouraged teacher participants to explore relationships between people, land, and knowledge systems, opening pathways for integrating Mātauranga Māori into sustainability education. Throsby and Petetskaya (2016) similarly highlight the value of recognising the interconnectedness of human and natural worlds to deepen understanding of sustainability in daily life.

Weaving knowledge systems in this way not only broadens understanding but also nurtures a restorative approach to sustainability education. The literature (Brown, 2010; Ritchie et al., 2015; Royal, 2005) suggests that such learning sustains wellbeing for people, communities, and the natural world. By recognising the interdependence of ecological and cultural sustainability, teacher participants began to view sustainability education as more than content, it became a way to sustain relationships with people, place, and environment.

This recognition of interconnectedness resonates with Meyer's (2013) 'holographic epistemology', which emphasises the interdependence of body, mind, and spirit, and complements the holistic nature of Mātauranga Māori. It also reinforces the need for sustainability education to embrace interconnected ways of knowing and being. Similarly, Sterling's (2017) concept of an ecological approach to being in the world encourages viewing the world as an integrated system, where both human and non-human elements are interwoven. Ward's (2017) notion of 'econnection', further supports this approach, highlighting the role of stewardship and awareness across cognitive, affective, and behavioural domains, supports this approach, deepening connection to place.

As a Pākehā (New Zealander of European descent) educator and researcher, I prioritised opportunities to braid streams of knowledge (Macfarlane et al., 2024), integrating Indigenous and Western epistemologies to support local, place-based learning. This aligns with McFadyen and Benade's (2021) call for a "sensitive understanding of the difference between Indigenous and Western worldviews" (p. 15). As outlined in the methodology chapter, the SELCD PLD was guided by Māori cultural advisors to ensure authentic engagement with Mātauranga Māori and avoid cultural appropriation. An appreciation stance (Enviroschools, n.d.) was maintained throughout the process,

supporting respectful and reciprocal learning. Collaboration with knowledge guardians and Māori experts ensured cultural sensitivity and accuracy and shaped the integration of Mātauranga Māori within the PLD. Their guidance informed discussions on kaitiakitanga (guardianship/ protection) and manatiaki (stewardship) (Alsop & Kupenga, 2016), as well as topics related to Te Taiao (the natural world), and Rongoā Māori (traditional healing with native plants). This approach reflects Royal's (2005) call for fostering relationships with the natural world while respectfully engaging with traditional knowledge systems.

Within the SELCD PLD, Mātauranga Māori was interwoven through learning about local iwi, protecting significant sites, exploring the mauri (life force) of the ngāhere (bush) and awa (river), and engaging with Rongoā Māori. Children's picture books, educational websites, and games were used to support this learning. During the final focus group, after one term of teaching, the teacher participants reflected on how the term's theme, 'Kō (town name) Tōku Tūrangawaewae', guided their social science inquiry. The synthesis of ideas from professional development sessions, focus groups, and curriculum meetings shaped the direction of teaching and learning. Local narratives, especially those centred on the awa, became the foundation for sustainability education practices in the school. Emphasis on connections between the past and the future echoed Selby et al. (2010), who argue that respecting and protecting the environment is essential to long-term survival.

Summary Section One

In this section, the cultural-discursive arrangements, embedded in the language and ideas of the SELCD PLD, were reflected in teacher participants' sayings as their understandings evolved. This was evident in discussions from Focus Groups Four and Five (see Tables 13 and 14). To further explore how practices evolved, an analytical framework was employed (see Table 18), mapping cultural-discursive changes before, during, and after the SELCD PLD. This enabled observation how shifts in these arrangements signalled the emergence of new practices. As Kemmis (2022) explains, such a framework helps identify when variations of existing practices become transformed into new species of practice.

In this study, the framework highlighted the conditions under which transformative learning occurred within specific cultural-discursive contexts. In the school, this transformation was evident in growing recognition of the value of local learning, deeper understanding of sustainability as both a concept and curricular lens, and a realisation that students are more engaged when learning is relevant and meaningful. Through these reflections, teachers' consideration of how the SELCD PLD influenced their planning and teaching evolved into new cultural-discursive arrangements that informed their ideas for future professional learning and pedagogical practice.

Table 18

Synopsis of Learning: Arrangements for Practice – Situated in how PLD is Arranged to Enable Sustainability Practices to be Developed.

How is PLD 'Stirred' into Practices? (Forms of Understanding)

T1 FG2: Data from FG1 + Int One 07/07/22 *T2 FG3: After five PLD sessions 28/10/22*	*T3 FG4: After seven PLD sessions 5/12/22* *T4 FG5: After one term teaching 28/3/23*
Practice architectures	Practices
Cultural-discursive arrangements **From (T1)** *Must link PLD to local area and connect with community to cultivate local identity, sustainability, and life skills through connection to local culture, identity, and the environment.*	**Sayings** **From (T1)** *PLD is seen as an opportunity for growth and need to develop a common understanding of sustainability, SE and SELCD, as well as link to local community and local issues, nurture individuals and focus on life skills rather than solely on academic targets.*
To (T2) *Equip teachers with tools and knowledge to integrate sustainability concepts seamlessly into classrooms, cater to teacher's needs by providing PLD focussed sessions that cover a range of valuable resources, ready-made lesson plans, innovative ideas, etc.*	**To (T2)** *Teacher participants are enthusiastic about incorporating sustainability and problem-solving into education. Changing teacher talk to encourage students to explore and understand 'why' behind their actions, adopting HHH approach to make SE more accessible and engaging for students.*
To (T3) *PLD promoted integration of SE into school curriculum while providing practical resources to support teachers. To integrate SE, the team will develop and share SELCD lesson plans that align with LC and current practices, gradually implement changes, recognising time required for transitions to a new way of planning without overwhelming the teaching team. Teachers expressed a desire for more guidance, modelled lessons, and step-by-step guidance on integrating SE.*	**To (T3)** *PLD resources were effective in promoting sustainability in the school community. Using tools like the SDG frameworks and digital maps of marae, the school can deepen its understanding of local history and culture, creating meaningful connections to the area. By taking localised action and using the frameworks, resources, the school can empower its community to foster and cultivate a culture of sustainability.*
To (T4) *The school's theme, 'Kō (town name) Tōku Tūrangawaewae' guided a comprehensive social sciences inquiry approach for both junior and senior hubs. The synthesis of ideas from professional development sessions, focus groups, and curriculum meetings shaped the direction for teaching and learning. While integrating HHH learning principles into planning, the overwhelming influx of additional PLD, covering various learning and teaching topics posed challenges for teacher participants in effectively transferring these learnings into the classroom.*	**To (T4)** *Local narratives, especially those centred around the river became the foundation for SE. Incorporating varied engagement methods and HHH learning significantly fostered a holistic understanding, however, the persistent challenge remains in consistently prioritising the Term's Kaupapa across all aspects of learning and teaching.*

From Thinking to Doing

The evolving sayings, documented in Table 18, reflect significant shifts in how teacher participants understood and articulated sustainability education. The cultural-discursive arrangements provided the conceptual foundation from which the teacher participants could form new meanings of sustainability education. Translating these transformed understandings into classroom practice, however, required engagement with the material-economic arrangements that shape what teachers can actually do. Moving from thinking to doing required navigating the organisational and practical realities and routines of the school: the availability of time for planning and reflection, access to teaching resources, allocation of funding, and the organisational routines that structure the school day. These material-economic conditions both enabled and constrained teachers' capacity to integrate new ideas into their teaching practice. Examining these dynamics reveals how conceptual change alone was insufficient, pedagogical transformation depended equally on the availability of supportive material conditions that could enable the implementation of sustainability education and new ways of working.

Section Two: Material-Economic Arrangements - Enabling Practice

To further explore how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design, this second section examines the material-economic arrangements that shaped the SELCD PLD. While the language and ideas introduced in the school SELCD PLD were shaped by the cultural-discursive arrangements, focusing on a holistic understanding of sustainability and viewing the curriculum through a sustainability lens, the activities and work of the SELCD PLD were influenced by the material-economic arrangements present in the school. These are conditions that Kemmis (2022) recognises as both evident and often unacknowledged. These include factors such as the structure, time and frequency of the PLD; the pedagogy of sustainability education; and the activities and frameworks that help teacher participants adopt new perspectives on the curriculum to teach sustainability concepts. For sustainability education PLD to be effective, van der Klink (2023) argues that teachers need time and support to adopt new ideas and change their beliefs and teaching methods. Therefore, the frequency and design of the SELCD PLD required careful consideration.

PLD Structure and Design

In this case study, the school principal scheduled the PLD sessions after school mid-week, aligning with the existing PLD timetable. However, analysis of the CPAR focus group data revealed that teacher participants did not consider this to be the optimal time for professional learning. They suggested alternatives, including full-day PLD sessions and individual coaching and mentoring time to complement the afterschool sessions. Bonne and Wylie (2017) describe observation and feedback cycles, referred to here as coaching and mentoring, as a key approach to enhancing a school's professional learning culture by supporting teachers in improving their pedagogy. These suggestions

to move beyond traditional teacher professional development reflect the teacher participants' differing perspectives on how the material-economic arrangements could be adjusted, as discussed by Kemmis (2022), to achieve different outcomes. While time constraints prevented the integration of a coaching and mentoring model during this research project, this supportive approach, endorsed in recent literature (Eames et al., 2010; Ernst et al., 2020; van der Klink, 2023), remains a potential area for future exploration.

Instead, a series of focussed, whole-school SELCD PLD sessions took place over two school terms, rather than a one-off event, a structure that van der Klink (2023) questions as sufficient for adequately supporting teachers. Given the inability to alter the schedule, PLD facilitation focussed on ensuring that the content was relevant and hands-on, responding to teacher participants' requests despite the limitations. Content considerations included incorporating sustainability education pedagogy and utilising existing resources to support sustainability teaching, a need also highlighted by Bolstad et al. (2015) as a limiting factor for teachers integrating sustainability into their practice.

Sustainability Education Pedagogy

The findings revealed that for the teacher participants to effectively teach sustainability, the SELCD PLD needed to support them in understanding both why sustainability is important and what and how to teach it. Schatzki's (2017) framework, which identifies three kinds of learning: know-how, knowing-that, and knowing 'X', provides a valuable lens for viewing the multifaceted nature of knowledge in teaching practices. Applying this tripartite system of learning to sustainability education PLD offers an original contribution by extending Schatzki's ontological account of knowing into a pedagogical model for teacher learning. It offers a conceptual structure for understanding how different forms of teacher knowing interact to shape the sayings, doings, and relatings within professional practice.

This framework offers a practical response to Jenkins (2015) concern about what and how we teach sustainability, providing clear guidance for both the content and delivery of the SELCD PLD. It was therefore crucial that both the content and pedagogy of the SELCD PLD were informed by these interconnected forms of knowledge, enabling teacher participants to create more impactful and contextually relevant learning experiences. In this study, teachers' evolving understandings reflected these interrelated modes of knowing: knowing that sustainability matters (conceptual knowledge), knowing-how to enact sustainability through pedagogy (procedural knowledge), and knowing 'X', a context-sensitive knowing grounded in place, relationships, and community. Designing the SELCD PLD around these dimensions ensured that both its content (knowing-that) and pedagogical processes (knowing-how and knowing 'X') worked together to deepen teachers' capacity for sustainability-oriented practice.

While Schatzki's views do not align entirely with Kemmis et al's. (2017) argument that learning should be conceived as "being stirred into practices", Kemmis (2021) proposes that learning can be understood as "coming to practice differently*"* (pp. 45-46). In this sense, teachers can come to practice in new ways by transforming existing practices into new ones (Kemmis, 2022). To analyse how teachers' professional learning connected to the sayings, doings, and relatings of their practice, data was collected and analysed across four points in time. Time One (T1) drew on Focus Group Two, which incorporated analysis of Interview One and Focus Group One. Time Two (T2) was based on Focus Group Three after five PLD sessions. Time Three (T3) used data from Focus Group Four after seven PLD sessions. Time Four (T4) drew on Focus Group Five after one term of teaching. Kemmis' (2022) heuristics guided the analysis of how teachers' professional learning shaped changes in their practices and revealed the practice arrangements that either enabled or constrained these changes, as summarised in Table 20 at the end of this section.

Although Kemmis' framework offers a way of conceptualising how teachers come to practice differently, Schatzki's practice theory provides a useful structure for discussing findings related to teachers' knowledge, skills, and understanding, particularly in relation to the material-economic arrangements and PLD activities that supported the development of their capabilities in teaching sustainability. Applying this framework within the CPAR process enabled teacher participants not only to deepen their understanding of what sustainability is, but also to learn how to teach it effectively. The following sections: 'Know-how', 'Knowing that' and 'Knowing X', examine how teacher participants' learning evolved over time, leading them to "practice differently" (Kemmis, 2022, p.163).

Know-how: Practical Knowledge and Skills for Effective Sustainability Practice

In the context of the SELCD PLD, 'Know-how' refers to the practical knowledge and skills essential for effective sustainability education and practice. This includes professional learning that equips teachers to integrate sustainability into their classroom planning and teaching. For example, 'Know-how' involves understanding how to teach holistically using the *heart, head,* and *hands* approach (Hulbert, 2022; Mitchell & Muller, 2010; Sipos et al., 2008), or as Marschall and Crawford (2022) describe, *connect, understand, act,* which teaches to the heart, the head, and hands. Engaging students in this kind of holistic learning involves the cognitive, social-emotional, and behavioural learning domains (Osman et al., 2017; UNESCO, 2017), supporting students to gain deep understanding while developing the knowledge, skills, and dispositions to take meaningful action on relevant issues. It also involves integrating sustainability across curriculum learning areas, localising learning to foster citizenship, and supporting students to meet Tilbury's (2019) challenge of becoming beacons of change, equipped to solve problems and drive transformation. Additionally, 'Know-how' encompasses the development of UNESCO's (2017) eight sustainability competencies: systems

thinking, anticipatory, normative, strategic, collaboration, critical thinking, self-awareness, and integrated problem-solving.

In the case study school, the teacher participants' 'Know-how' was linked to themes related to te Awa (the local river). Following two terms of SELCD PLD, the school selected the United Nations Sustainable Development Goal 11: Sustainable cities and communities, aligned with Good Life Goal 11: Love where you live, as the overarching theme. This guided interdisciplinary learning and integrated across the curriculum, focused on the head, heart, and hands model that had been integral to the SELCD PLD.

During CPAR Phase Three, a local story served as the entry point to sustainability education and local curriculum design. In Social Sciences, students examined different perspectives on river use and its impact and studied its geographical and historical significance. In Science, they used the *'Water analysis: Te wai'* kit from House of Science to assess the river health through ecological indicators such as pH, turbidity, and invertebrate counts. Some classes participated in planting along the river to support restoration. In English, students re-enacted the local story through drama and digital storytelling, creating multimedia retellings that connected place to identity (see Table 19)

Table 19

Examples of Holistic Head, Heart, and Hands Integrated Sustainability Learning

Learning Area	Learning Activity	Type of Learning
Social Sciences	- Examining different perspectives on river use and its impact on locals	Heart, Head
	- Studying the geographical features of the river	Head
	- Identifying historical streams and creeks	Head
	- Exploring the history and significance of the river	Heart, Head
	- Understanding the impact of farming on land use and waterways	Head, Heart
Science	- Using 'Water Analysis – Te Wai' kit to test water quality parameters (pH, turbidity, etc.)	Head, Heart
	- Engaging in planting along the river for ecological restoration	Head, Heart, Hands
English	- Role playing the local story	Head, Hands
	- Researching the history of the town and significant places	Head
	- Creating information signs about the local area to show the significance for visitors	Head, Heart, Hands
	- Creating a digital, multimedia story for ongoing retelling of the local story.	Head, Heart, Hands

Knowing that: Understanding what Sustainability Education Entails

In the SELCD PLD, 'Knowing that' refers to understanding what sustainability and sustainability education entail, along with the pedagogical methods used to teach these concepts. It includes knowledge sustainability-rich concepts (e.g., social justice, wellbeing, resources) as suggested by Jenkins (2015), recognising that sustainability issues are both local and global, and understanding that sustainability education is issues-based. It also includes knowing that students develop action competence through solution-oriented thinking (Jenkins, 2015; Jensen, 2002; Weil, 2016), and that effective sustainability education requires systems thinking (Cloud, 2010; Crawford & Montague, 2017; Marschall & Crawford, 2022), holistic "heart, head, and hands" learning (Gazibara, 2013; Inan & Inan, 2015; Sipos et al., 2008), and related frameworks (Osman et al., 2017; UNESCO, 2017). Importantly, teachers must learn to avoid overwhelming students with despair, instead fostering a sense of hope and agency that will empower students to believe they can address the issues that matter to them (Freire, 1992; Harré et al., 2017; Wals, 2015; Weil, 2016).

During CPAR Phase Two, early PLD activities invited participants to identify local and global issues, reflecting on their what they see, hear, and read in their communities. These discussions connected sustainability's environmental, cultural, economic, and social dimensions with local contexts and pedagogy. Using Marschall and Crawford's (2022) teacher's guide, practical activities demonstrated how to empower students to act on issues they value. One key activity explored types of action using Berger Kaye's (2010) model four action types: direct action, indirect action, advocacy, and research for action. Teachers worked in groups to define and match examples to each action type. This practical exercise illustrated how students could engage in solutionary (Weil, 2016) work through multiple pathways. This understanding aligned with Guterres' (United Nations, 2021) call to treat young people "as powerful agents for change" (p. 6).

Knowing X: Blending Practical Experience with Theoretical Understanding

Building on 'Know-how' and 'Knowing that', 'Knowing X' synthesises these forms of knowledge within the school's specific context. It focusses on understanding the community's particular challenges and opportunities and how these relate to curriculum design (LeGrange, 2011). In this case, 'Knowing X' also included teacher participants' awareness of students' needs, classroom dynamics, and the wider community. 'It involved community-based learning experiences and partnership with local organisations, such as creating informational signs about the local area to make the learning meaningful and place-based (Jenkins, 2015; Taylor et al., 2015; Tilbury, 2019).

Summary of Section Two

Section Two examined the material-economic arrangements that shaped and were reshaped through the SELCD PLD, revealing how practice conditions such as time, structure, and access to resources influenced teacher participants' capacity to enact sustainability education. These

arrangements structured the conditions under which teachers' learning developed. The effectiveness of professional learning and development was also influenced as teacher participants navigated competing demands, after-school scheduling, and limited opportunities for coaching and mentoring. Within this context, the SELCD PLD sought to provide hands on, contextually relevant learning that aligned with teacher's everyday realities. Applying Schatzki's (2017) three forms of learning: 'Know-how', 'Knowing that', and 'Knowing X', revealed how these different kinds of knowing were intimately tied to material conditions. Knowing-that was developed through conceptual engagement with sustainability ideas; know-how emerged as teachers experimented with new pedagogies and available resources; and knowing-X evolved from contextual, place-based application shaped by the school's physical and organisational environment. The findings demonstrate multiple ways in which material-economic arrangements influence the reciprocal relationship between teacher participants' knowing and the school's organisational structures, showing how each shapes and reshapes the other in the process of pedagogical transformation.

Table 20 captures material-economic changes across four distinct points of analysis (before, during, and after the SELCD PLD), illustrating when existing practices evolve into a new species of practice (Kemmis, 2022). This framework maps conditions under which transformative learning occurs within specific material-economic contexts.

Table 20

Synopsis of Learning: Arrangements for Practice – Situated in how PLD is Arranged to Enable Sustainability Practices to be Developed.

How is PLD 'Stirred' into Practices? (Modes of Action)

T1 FG2: Data from FG1 + Int One 07/07/22 *T2 FG3: After five PLD sessions 28/10/22*	*T3 FG4: After seven PLD sessions 5/12/22* *T4 FG5: After one term teaching 28/3/23*
Practice Architectures	Practices
Material-economic arrangements **From (T1)** *Flexible approach to sustainability professional learning sessions, design sessions to bring clarity through comprehensive frequent sessions.*	**Doings** **From (T1)** *Hands-on practical learning: modelling and doing, experiential learning where teacher participants are actively engaged through hands-on practical activities is important during PLD, rather than passive listening/ telling.*
To (T2) *Time and support to engage in strategic planning and successful sustainability integration, acknowledging challenges of limited timetables, disruptions caused by Covid-19 and growing class sizes. To avoid overload PLD should be broken down into frequent, shorter sessions.*	**To (T2)** *PLD resources provide immediate practicality and encourage students to explore sustainability topics in more depth through meaningful conversations, explorations and problem-solving. Able to use resources right away to tackle real-world problems.*
To (T3) *Teachers recognise the importance of time to establish meaningful learning/ connections through the integration of PLD into practice. The importance of ongoing planning discussions, new planning templates, timing, and structure of PLD sessions is recognised with a range of options suggested for consideration Integrating HHH framework into school planning is evolving and a priority. Ultimately, decision making is deferred to the school principal.*	**To (T3)** *Integration of SE frameworks and resources can emphasise SE learning. Planning and resource building are essential to create a comprehensive learning journey across the school, breaking down units of work into manageable segments with resources provided week to week. The involvement of the junior school students in waste management highlights the practicality/ action component of SELCD.*
To (T4) *The school's dynamic approach to their themed learning/ Kaupapa, reflected in, 'Kō (town name) Tōku Tūrangawaewae' and the upcoming Matariki focus explores self, community, and cultural narrative in spatial contexts. However, interruptions to learning, timetable constraints and the dominance of DMIC hinder seamless Kaupapa (thematic) integration. Professional learning, though enriching, faces challenges in replication due to time and resource limitations. A call for hands-on, community driven, goal-oriented approaches emerge, advocating for flexibility and collaboration to align with the thematic focus while reevaluating rigid timetable structures.*	**To (T4)** *Teaching practices integrate local culture, environmental exploration, and interdisciplinary learning methods. Despite time constraints, flexible approaches adapt to classroom needs fostering curiosity and community-based learning. Emphasis on sustainability and local engagement links classroom learning to real-world actions, though deeper explorations and resource allocation are needed. Efforts to integrate local knowledge into practical actions, such as developing information signs for the community require navigating permissions. Structured, detailed planning is necessary to explore themes more deeply and interconnect NZC learning areas for comprehensive thematic learning.*

From Resources to Relationships

The material-economic arrangements provided the temporal and resource conditions for SELCD PLD; however, the effectiveness of these conditions depended on the quality of professional relationships, how the teacher participants related to one another, and how they positioned themselves within the learning environment. The social-political arrangements, the relationships, power dynamics, and collaborative structures shaped the ways in which teacher participants felt supported, valued, and empowered to take risks embedding sustainability education pedagogy and translating new understandings into their practices.

Section Three: Social Political Arrangements - Structuring Relationships

To address the central research question of how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design, this section explores the influence of social-political arrangements within the case study school, particularly those shaping collaboration, leadership, and decision-making. Kemmis et al. (2025) describe learning as a social process, embedded in the everyday practices of a community. In the case study school, the SELCD professional learning unfolded in a social-political context, where power dynamics became a central feature of the collaborative process. Much of this professional learning occurred after school in the staff room and involved the entire teaching team and school leaders. Collaborative sessions, where ideas were shared during the focus group discussions, played a key role in shaping the content of the SELCD PLD.

The social spaces where these discussions occurred supported the emergence of sustainability practices, aligning with Theory of Practice Architectures (Kemmis et al., 2014b), which identifies three interrelated dimensions of practice. While cultural-discursive arrangements were introduced through the language and ideas embedded in the SELCD PLD, and the Material-Economic arrangements were reflected in the school's physical spaces, time allocation, PLD activities and resources, the SELCD PLD also developed within a social-political space. These social-political arrangements, evident through system roles and lifeworld relationships, significantly influenced teacher participants' ways of relating, particularly in the context of SELCD practices (Kemmis, 2022).

Power Dynamics: Micropolitics in Collaboration

As the collaborative sessions progressed, power dynamics, both overt and subtle, played a significant role. Initially, the principal held substantial authority, shaping both the structure and tone of the CPAR focus group sessions. In addition to holding key decision-making responsibilities, his perspectives were regarded with respect by the teacher participants, who often looked to him for guidance when he was present. This dynamic reflected the micro-political landscape that, as Edwards-Groves (2018) argues, influences educational practices. Therefore, it was essential to examine the social interactions within the school site, particularly in relation to power, agency, and

solidarity. As Grootenboer and Edwards-Groves (2023) highlight, it is this “human interactivity” (p. 4) and the “lifeworld relationships” described by Kemmis et al. (2025, p. 26) that shaped interactions between teacher participants and school leaders throughout the CPAR process.

Over time, as teacher participants became more comfortable with the collaborative approach, power dynamics began to shift. The micropolitics of the school, such as relationships between staff members and their positions within the school hierarchy, subtly influenced how ideas were shared, accepted, and implemented. In the beginning, power was more centralised, but as teacher participants engaged more with each other, they gained greater collective agency in the development and integration of sustainability education practices.

This shift in power dynamics reflects the transformation of social-political arrangements (Kemmis et al., 2025) within the school. Initially, hierarchical role relationships positioned senior leaders as primary decision-makers, with teacher participants largely responding to top-down directives. However, as collaboration developed, these relationships evolved into more reciprocal forms of professional engagement, with teacher participants increasingly recognised as co-constructors of practice. Evidence of this shift was seen in the way teacher participants began contributing ideas more openly and confidently during focus group sessions, often initiating discussions and building on each other’s contributions. This transformation aligns with Kemmis et al.’s (2025) concept of lifeworld relationships, in which professional interactions move beyond formal authority structures to foster more democratic and collegial ways of working. As a result, teacher participants’ roles became more aligned with “inclusive and non-alienated engagement” in curriculum development (Kemmis et al., 2025, p. 130).

These shifts in power relations highlight the evolving nature of participatory practices in educational settings. Initially shaped by top-down authority, the changing dynamics within the school began to reflect democratic principles and participatory practices. As teacher participants grew more comfortable with collaborative approaches, they gained a greater sense of collective agency in shaping the curriculum, aligning with Kemmis et al.’s (2025) perspective that practices occur through both individual and collective agency. This evolution in power relations not only influenced professional learning but also reinforced a whole-school commitment to sustainability, embedding these changes within everyday practices as teacher participants came to practice differently (Kemmis, 2021; Sjølie et al., 2020).

A Unified Approach: Whole-School Commitment to SELCD Professional Learning

Expanding upon the evolving power dynamics, a whole-school commitment to SELCD is essential for ensuring that sustainability integration is embedded across the school. This requires a unified approach in which all stakeholders are engaged in the learning process, reinforcing the collective

responsibility for curriculum development. For change in educational practice to occur, a whole-school approach is required (Eames et al., 2009; Tilbury & Wortman, 2005; Wals et al., 2024; Wals & Mathie, 2022). Eames et al. (2009) consider the dimensions of people, programmes, practices, and place; a useful guide for schools aiming to embed sustainability. The framework helps schools assess their progress and reinforces that sustainability cannot be approached in isolation. While professional learning and development can support transformational change (Kalnins, 2018), involving the whole teaching team in PLD is key to developing a culture of sustainability (Hargreaves, 2008; Tilbury & Galvin, 2022). Barr et al. (2014) echo this, stating that sustainability "cannot be accomplished in a silo", and that all individuals in the school need to work together (p. 1). In this context, Eames et al.'s (2009) framework provides a practical tool evaluating how effectively schools engage all stakeholders (teachers, students, and the wider community). Tilbury and Galvin (2022) advocate bringing sustainability "to the heart of the school" (p. 8), promoting the "mainstreaming" of sustainability into all aspects of schooling (p. 9).

Cultivating this approach to learning requires active community involvement, something the teacher participants in this research acknowledged throughout the study. One participant recognised that the practices of sustainability education were enabled because the SELCD PLD was done together, highlighting the importance of shared learning experiences for lasting change. Taking a collective, whole-school, approach to SELCD PLD over a sustained period enabled the team to develop a common understanding of what SELCD consists of for their school context (Zachariou et al., 2024). Building on Eames et al.'s (2009) framework, Wals and Mathie (2022) offer a complementary *flower model* for whole school approaches (WSA), considering curriculum, pedagogy and learning, professional development, school-community relationships, school practices, ethos, vision, and leadership (p. 2). As depicted in Figure 10, this model emphasises the interconnectedness of educational domains, reflecting the school's vision and values.

Wals and Mathie's (2022) WSA responds to Sterling's (2001, 2004, 2017) argument for "whole system redesign" (Wals & Mathie, 2022, p. 2). A crucial aspect of this model is leadership enabling teams to learn together, and develop curriculum aligned with the school's vision (Wals & Mathie, 2022). In the case study school, leadership played a crucial role by coordinating PLD times and ensuring whole team participation. While the SELCD PLD was not specifically designed around this model, all domains of the model were considered during the PLD, particularly the connection to the school's vision and values and to the local area.

Figure 9

A Whole School Approach to Sustainability

Note. Reprinted from "Whole School Responses to Climate Urgency and Related Sustainability Challenges: A Perspective from Northern Europe," by A. J. Wals, and R. G. Mathie, 2022, In M. A. Peters and R. Heraud (Eds.), *Encyclopedia of Educational Innovation,* p. 4. Copyright 2022 by Springer Nature. Reprinted with permission.

In this study, the critical participatory action research (CPAR) methodology facilitated a commitment to whole-school learning by engaging teacher participants in iterative cycles of discussion, action, and reflection. Individual interviews and focus group discussions supported a culture of reflexivity through monitoring and evaluating as advocated by Wals and Mathie (2022). Through these cycles, teacher participants were empowered to design learning relevant to their students' lives, moving toward a more ecological and interconnected view of education (Sterling, 2001). While a whole-school approach provides the structure for sustainability education, it is the active engagement of teachers that drives meaningful change. Exploring teacher engagement highlights the need for PLD to be relevant and transformative.

Fostering Teacher Engagement: Meaningful Professional Learning

Teachers are an important consideration for successful integration of sustainability education (Zachariou et al., 2024). Consequently, teacher professional learning and development (PLD) is essential. For lasting change, it is important to shift from mechanistic approaches to ecological or whole systems thinking (Sterling, 2001, 2017). Sterling advocates a holistic approach to education,

emphasising values, knowledge, and skills, aligning with transformational sustainability education literature (Osman et al., 2017; Tilbury, 2016; UNESCO, 2017).

To encourage this thinking, the SELCD PLD in CPAR Phase Two included sessions focused on values, knowledge, and sustainability pedagogy. Active learning techniques, such as discussions and group work, gave teacher participants opportunities to reflect on how new concepts applied to their classroom contexts and to explore ways to incorporate them into practice. According to van der Klink (2023), teachers need time and sustained support to shift beliefs and teaching methods. Similarly, Timperley et al. (2007), in their synthesis of effective PLD, highlight "sufficient time for extended opportunities to learn" as one of seven key elements for impact (p. xxvi). The extended nature of the SELCD PLD was therefore essential.

Additionally, sessions that integrated heart, head, and hands planning, systems thinking, types and kinds of action, local geography and history, and relevant resources enabled the application of sustainability concepts in authentic, locally grounded ways. This deepened engagement with the local context supported shifts in pedagogy. Data from the second interviews and final focus group (FG5) indicated that teacher participants felt more confident in their comprehension of sustainability concepts. This growth was attributed to the contextual relevance of the SELCD PLD, which enabled them to meaningful planning and teaching about their local area and its stories. Teacher participants also expressed enthusiasm for continued professional learning.

These social-political arrangements also directly influenced emotional engagement, evident in their affective responses during interviews and focus groups. Teacher participants frequently expressed positive emotions about the PLD using phrases such as, "Awesome to see…", "Glad we did…", "Success is…", "It was cool to…" One participant shared that, despite no prior experience with sustainability education, she now felt passionate about teaching it. These responses align with evidence that professional development is more impactful when it is engaging and enjoyable (Timperley et al., 2007).

Research suggests that positive emotional engagement in professional learning supports teachers to internalise new practices and sustain pedagogical change (Evans et al., 2024; Ryan & Deci, 2000). Furthermore, Guskey (2000) emphasises participant reactions as a key aspect of evaluation, recognising the importance of asking, 'Was it useful?' to assess initial satisfaction. A supportive and stimulating learning environment enabled the SELCD PLD not only to survive initial adoption but to thrive, fostering growth in pedagogy. Teacher participants' emotional investment in the PLD contributed to both individual development and the wider social-political arrangements of the school. As teacher participants became more personally committed to sustainability, they collectively influenced the momentum and direction of collaborative change.

The Power of Collaboration: Collective Agency in Curriculum Development

According to Kemmis et al. (2025), practices emerge through both individual and collective agency. In the context of curriculum development, collective agency empowers teachers to co-construct inclusive, responsive learning communities. As meaningful and sustained professional learning increases teacher engagement, collaboration becomes essential, not only for curriculum design but also for reinforcing democratic participation and shared ownership. This shift aligns with broader social policy trends, such as the formation of Kāhui Ako (Communities of Learning), established under National government policy and supported through the *Investing in Educational Success* (IES) initiative (MoE, 2014, 2016b), with brokered PLD as a key component. Within these communities, social capital, emerging from social relations and structures, plays a crucial role (Kamp, 2019; Plagens, 2011). Kilpatrick et al. (2001) define social capital as the resource derived from social relationships, enabling individuals and groups to achieve goals otherwise difficult to attain alone.

In schools, socio-political arrangements exemplify social capital, as seen in how SELCD PLD influenced teacher participants' interactions, values, and emotions in this study. Dewey's (1915) views of social capital as a positive force highlights the importance of collaboration, while Bourdieu (1986) notes its multiplier effect, enhancing what individuals can achieve through collective networks. Within curriculum development, collective agency refers to the capacity of a group to work together with shared purpose and initiative, leveraging collective action to create meaningful change. In the SELCD PLD, everyone was involved in the educational work. Dewey (1916) emphasised that society endures by transmitting habits of feeling, thinking, and doing, what is referred to in this research as heart, head, and hands learning, from older generations to younger ones, communicating ideals, hopes, and expectations for the future. He asserted that, "society must by nature undergo a constant reworking of its social fabric" (Plagens, 2011, p. 8), a process reflected in the teaching and learning that takes place in schools.

A collaborative approach to curriculum development, as suggested by Fien and Maclean (2000) and emphasised by Hurd and Ormsby (2021), supports teachers to embed sustainability education into teaching and learning. In Aotearoa New Zealand, Bonne and Wylie (2017) report that schools with high levels of collective practice not only experience higher morale but also place a strong emphasis on curriculum development. Similarly, teacher participants in this study embraced a commitment to SELCD, recognising that sustainability practices were enhanced by engaging in PLD together. They further acknowledged that collaboration among colleagues is crucial for planning, idea-sharing, and problem-solving to create a locally focused curriculum, aligning with Bonne and Wylie's (2017) findings that identified teacher sharing (knowledge of students, teaching ideas, assessment resources, teaching resources, lessons and planning) as a key aspect of school culture. Although Bonne and Wylie (2017) found that more work was needed in sharing lessons and planning, teacher

participants in this study suggested prioritising these areas by incorporating more team planning and curriculum development meetings into the existing timetable.

Through the collaborative SELCD PLD process, teacher participants designed impactful learning experiences in which students were not only taught about sustainability but encouraged to live their learning through action. Two examples include junior students raising awareness of where rubbish ends up by painting around the school drains, and senior students creating signs to explain the history and significance of the local area for visitors. By addressing real-world issues that matter to them, students were encouraged to take action, an essential principle in Tilbury and Galvin's (2022) sustainability framework. This impact was further evident during FG5, conducted after the SELCD PLD and a term of teaching. Teacher participants recognised how collaborative problem-solving and shared insights empowered them to design learning that was meaningful and relevant as students explored their interconnectedness with each other and the world.

Teacher participants engaged with the local community through marae visits and focused on the local river (awa) to strengthen student involvement. The school's social-political arrangements supported this collaborative approach by incorporating a specific Kaupapa, aimed at strengthening connections within the local community. Moreover, teacher participants recognised that for sustainability education to become embedded in the school's culture, ongoing PLD was essential. They emphasised organising regular team meetings to ensure SELCD pedagogy, planning, and practices are continuously prioritised, developed and integrated into learning and teaching.

Summary of Section Three

Section Three explored the social-political arrangements that supported professional relationships, influencing collaboration, leadership, and decision-making within the SELCD PLD. Initially the school's professional learning culture was characterised by hierarchical power relations but evolved toward becoming more democratic and collegial as the teacher participants developed collective agency. This shift reflected growing trust, shared leadership, and a whole-school commitment to sustainability education. Through the critical participatory action research process, teachers became co-constructors of practice, embedding sustainability into everyday teaching and curriculum design. These findings highlight that transformative professional learning depends on social-political conditions that foster collaboration, distributed leadership, and shared purpose within the school community. Table 21 summarises social-political shifts across four distinct points of analysis (before, during, and after the SELCD PLD), indicating where established practices are reshaped as new forms of practice (Kemmis, 2022).

Table 21

Synopsis of learning: Arrangements for Practice – Situated in how PLD is Arranged to Enable Sustainability Practices to be Developed

How is PLD 'Stirred' into Practices? (Ways of Relating to Each Other and the World)

T1 FG2: Data from FG1 + Int One 07/07/22 *T2 FG3: After five PLD sessions 28/10/22*	*T3 FG4: After seven PLD sessions 5/12/22* *T4 FG5: After one term teaching 28/3/23*
Practice architectures	Practices
Socio-political arrangements **From (T1)** *Collective participation and collaboration are essential for effective, sustainable PLD. Learning together supports the journey and empowers everyone to contribute to the vision, giving each participant a voice and ownership in shaping the curriculum.*	**Relatings** **From (T1)** *PLD together is more meaningful and powerful if everyone sees the value in the PLD experience. By engaging in the learning process as a team a strong foundation will be created for mutual support.*
To (T2) *Challenges faced due to Covid-19 meant meeting the needs of people first, ensuring wellbeing of students and staff before learning. Emphasis is now on starting afresh, building a supportive and collaborative learning environment through involvement of the team in generating ideas and setting priorities.*	**To (T2)** *The team worked together towards a shared vision and clear integrated Kaupapa-based approach. Sharing of ideas was promoted, and staff collaboration in PLD was recognised as powerful when it leads to actionable outcomes. Immediate action from PLD insights can foster a positive atmosphere for planning and exploring possibilities with students.*
To (T3) *Concept of committing to SELCD embraced by teachers. Practices of SE have been facilitated by engaging in SELCD PLD together, creating a shared purpose. An increase in teamwork and collaboration is expected in the upcoming year. The weekly planning process will evolve to ensure alignment and connection to overarching termly plan and Kaupapa.*	**To (T3)** *PLD and collaborative learning has helped pave the way for increased teamwork moving forward. The team created a supportive environment in which they encouraged mutual learning. The PLD facilitation style, resources, and knowledge were well received and SELCD PLD sessions have been a vehicle for professional growth as the team engaged in collective learning experiences.*
To (T4) *Thematic planning with a specific Kaupapa evolved from individual to collective team efforts, aiming to strengthen connections within the community. Gaining whānau support for events like regattas remains a challenge, prompting a need to understand barriers and references. Prioritising and sharing the implementation of professional learning among teachers is crucial, requiring organised team meetings to ensure SELCD is embedded into teaching practices.*	**To (T4)** *The teacher participants' exploration emphasised connection to local narratives and the environment, fostering hands-on learning experiences. Engaging with local community through marae visits and a focus on the local river strengthens student involvement. While professional learning sparks a localised curriculum focus, the need to balance dominant teaching methods necessitates reconsideration. Collaborative problem-solving and shared insights empower teachers, encouraging a collective and meaningful approach to exploring their interconnectedness with each other and the world.*

From Separate to Integrated

While Sections One, Two, and Three have discussed each practice arrangement separately, in reality these arrangements are entangled, reciprocal, and dynamic. Within the SELCD PLD, each depended on the others for professional learning to be effective. For example, the introduction of sustainability education frameworks (Osman et al., 2017; UNESCO, 2017) supported teacher participants' conceptual understanding of how to teach sustainability; however, this knowledge could only be internalised and applied in practice through time for reflection, collaborative discussion, and practical application. These interdependencies illustrated that pedagogical agency emerged through the interplay of cultural-discursive, material-economic, and social-political conditions.

Summary of Part One: Practice Architectures Impact on Teacher Participants

Part One of this chapter examined how cultural-discursive, material economic, and social-political arrangements shaped teachers' professional learning within the SELCD PLD and influenced the embedding of sustainability in the school's local curriculum design. Together, these interrelated dimensions illustrate how teachers' professional learning was socially, materially, and discursively constituted, shaping the ways they came to "practice differently" (Kemmis, 2022, p.30).

The cultural-discursive arrangements established a shared language for sustainability education and set the conditions for change. Dialogue about interconnected local and global issues grounded learning in place, centred tangata whenua histories, and fostered a collective purpose for curriculum design. The material-economic arrangements influenced how professional learning was enacted within the school's specific conditions and structures. The design and timing of the PLD, alongside its pedagogical approaches, determined how teachers engaged with new ideas and translated them into practice. Finally, the social-political arrangements shaped collaboration, leadership, and power relationships within the PLD process. A whole-school commitment emerged, supported by leadership and community engagement, reinforcing sustainability as a shared professional and pedagogical endeavour.

Collectively, these three arrangements demonstrate that transformative professional learning depends on the interplay between meaning-making, structural support, and collaborative agency. Aligning these dimensions created the conditions for enduring change, enabling teachers to integrate sustainability education meaningfully and systematically within their local curriculum. Building on these findings, Part Two of the discussion focuses on the conceptual and theoretical framing of sustainability education, exploring how metaphor and theory can deepen meaning and guide more transformative understandings of teaching and learning for sustainability.

Part Two

Conceptualising Sustainability Education: Metaphor and Theory

Understanding Sustainability Education as a Concept

In this research, the complexity and necessity of decoding sustainability within education were highlighted by teacher participants, who emphasised the disconnect between narrow interpretations and holistic understandings of the concept. Their perspectives echoed long-standing findings in the literature on sustainability education within the school context. As Taylor et al. (2015) contend, achieving a more sustainable future requires a shift in individual and collective values, alongside the development of policies and practices that promote environmental responsibility, social equity, and economic viability. Similarly, while Bolstad et al. (2015) identify growing research in Aotearoa New Zealand on education for the environment and sustainability (EE/ EfS), they also note three key persistent barriers preventing teachers from fully integrating sustainability in their practice: insufficient knowledge and confidence, limited access to support and resources, and differing levels of importance placed on Education for Sustainability (EfS).

These barriers were also evident in the case study school. However, the framework of practice architectures, as described by Edwards-Groves (2018), Kemmis (2022), and Kemmis et al. (2014b) provided a means to analyse educational practices and respond to the disconnect evident both in the literature and this study's findings. This framework enabled a close examination of the cultural-discursive, material-economic, and social-political arrangements that shaped teacher participants' practices, specifically their forms of understanding, modes of action, and ways of relating. Through applying the practice architectures framework, teacher participants were able to identify the enablers and constraints influencing their ability to integrate sustainability education. This analysis directly informed the design and delivery of the SELCD PLD, ensuring that professional learning was contextually responsive to the barriers teachers experienced. Building on these conceptual understandings and the analytical insights offered by the practice architectures framework, the following section presents the case study findings and shows how these theories translated into teachers' professional learning and pedagogical shifts.

Case Study Findings and Theoretical Connections

The findings reveal that teacher participants' shifts toward problem-solving and critical thinking in their teaching practices, evident in their sayings, doings, and relatings, were accompanied by a growing recognition that the curriculum as a whole can be viewed through a sustainability lens (Figure 8). This interpretation aligns with the New Zealand Ministry of Education's (MoE, 2022, 2024) emphasis on Education for Sustainability (EfS) as a lens for local curriculum design.

A practical expression of this perspective is using the power of story to build connections. As Marschall and Crawford (2022) explain, stories shape people's attitudes, beliefs and behaviours. In

the case study school, pūrākau (local narratives), particularly those centred on the awa (river), became foundational in aligning educational purposes with sustainability principles. Storytelling can be used to teach or reinforce concepts, bring new perspectives, and address misconceptions (MoE, 2015). The integration of local culture, environmental inquiry, and interdisciplinary learning fostered a holistic, hands-on approach, consistent with models advocated by Sterling (2001) and Wals (2016). Collaborative planning and reflection further emphasised the interdependence between education and environmental stewardship, strengthening the coherence between classroom learning to real-world sustainability action. In this way, the teacher participants' evolving practices exemplified how theory and metaphor, articulated through the practice architectures framework, can translate into tangible pedagogical shifts that embed sustainability within everyday teaching and learning. These findings informed the development of a visual and conceptual representation, illustrated in Figure 8, that captures how sustainability education can be understood as both practice and perspective within the school context.

Lens of Sustainability: A Way to View Curriculum

The practice arrangements, represented metaphorically as the roots of the flower in Figure 8, emerge from the interplay of cultural-discursive, material-economic, and social-political conditions that exist within or are brought into a school (Edwards-Groves & Grootenboer, 2024; Kemmis & Grootenboer, 2008; Kemmis et al., 2014b, 2025). These *roots* illustrate how educational practices are sustained and nourished by the enabling and constraining arrangements within a school's ecosystem, forming the foundation from which sustainability education can grow.

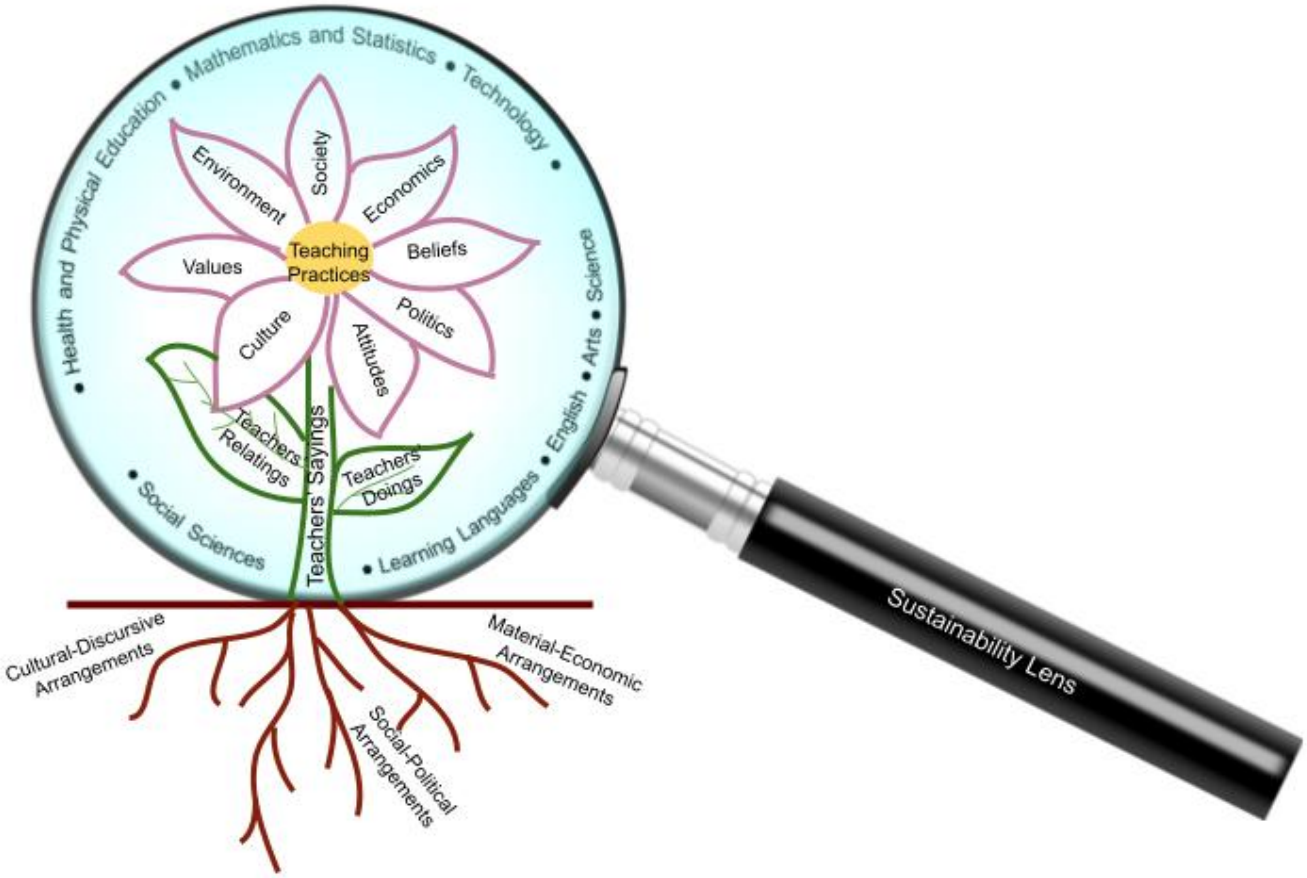
One way to view education and curriculum is through the lens of sustainability; a perspective also advocated by Te Poutāhu Curriculum Centre on Tāhurangi, the new New Zealand curriculum website, which states, "EfS is a lens through which to design your local curriculum" (MoE, 2024, para. 4). Figure 8 visualises the interconnected nature of sustainability education, the influences of practice arrangements, and teaching practices. Using a flower metaphor, the diagram, symbolises the interdependence of environmental, social, cultural, and economic dimensions of sustainability, while also highlighting the practice architectures that shape and enable teaching practices (Edwards-Groves, 2018; Kemmis, 2022; Kemmis et al., 2014b, 2017). In the case study school these architectures influenced teachers' thinking and understanding (sayings), skills and capabilities (doings), and values, emotions, and relationships (relatings); the conditions that support and sustain sustainability education in schools.

The magnifying glass in the diagram reinforces the importance of critical reflection in sustainability education, evident in the case study school through teacher participants' reflexivity during focus group discussions. The magnifying glass represents how sustainability functions as a lens for examining curriculum and pedagogy, drawing attention to the interconnected social, environmental,

cultural, and economic dimensions of learning (Osman et al., 2017; Taylor et al., 2015; UNESCO, 2017). It also signifies the need for a critical perspective on how values, beliefs, and institutional structures shape sustainability education (Hulbert, 2022; Osman et al., 2017). In this sense, the magnifying glass positions sustainability as both a pedagogical framework and an ethical inquiry, an approach that invites teachers to critically reflect on their role in fostering students' understandings, attitudes, and behaviours as active global citizens (Crawford & Montague, 2017; Wamsler, 2020).

Figure 10

Lens of Sustainability: A Way to View Curriculum



Metaphors as Conceptual Tools for Sustainability Education

Extending beyond its illustrative purpose, the metaphor presented in Figure 8 also functions as a conceptual and analytical tool for understanding the relational dynamics of sustainability education. Building on this, viewing sustainability education metaphorically offers a structured way to conceptualise its purpose, influence, and role within the curriculum. The flower metaphor represents the interconnected elements of sustainability education (MoE, 2022, 2024; Mulligan, 2018; Osman et al., 2017), as well as the moral and cultural principles that guide decision-making and behaviour (Murray, 2011; OECD, 2019, 2021). The magnifying glass, meanwhile, signals the need for critical examination of curriculum structures, teacher agency, and how sustainability is integrated into classroom practice (MoE, 2024), as reflected in the findings of this study.

This conceptualisation aligns with Dewey's (2008b) view of education as a dynamic interplay between individual and social dimensions, fostering participation in shared activities that transform ideas and emotions (Biesta, 2016). Dewey's emphasis on democratic participation highlights the usefulness of metaphor in envisioning sustainability education as an evolving interactive endeavour, as illustrated through CPAR phases one, two, and three. Biesta's (2016) three overlapping educational functions: qualification (developing knowledge and skills to act competently), socialisation (participating in and contributing to social, cultural, and professional communities), and subjectification (cultivating autonomy, critical thinking, and agency) offer a productive lens for interpreting the teacher participants' experiences. Of these, subjectification resonates most strongly with the aims of sustainability education, which seeks to foster emancipatory and transformative learning. It invites learners to question established assumptions, explore alternative ways of engaging with the world, and act with ethical purpose. In the case study school, teacher participants' growing capacity to design learning that encouraged student agency and critical reflection reflected movement towards this dimension of subjectification, signalling a shift from transmitting knowledge to enabling participation in meaning-making and transformation.

Thus, the metaphorical framing in Figure 8 serves not only as a visual representation of the findings but also as a conceptual tool for other schools to use that reflects these deeper educational principles. It illustrates sustainability education as holistic, participatory, and transformative, requiring both structural change and critical engagement from educators and students alike.

Transformative Education: Building Agency for a Sustainable Future

Building on the metaphorical framing of sustainability education, transformation emerges as both its purpose and its process. Kemmis and Mutton (2012) describe education as a means of introducing individuals and communities to new ways of understanding and interacting with the world; an ongoing process that fosters self-expression, self-development, and collective agency. This view highlights education as a relational, participatory practice that extends beyond individual benefit to contribute

meaningfully to the broader community. This perspective aligns closely with the goals of sustainability education, which seeks to equip learners with the capacity to engage in transformative practices that promote both personal empowerment and collective wellbeing (Jickling & Sterling, 2017; Lotz-Sisitka, 2017; Sauvé, 2017).

In this framing, the petals of the flower metaphor represent the various dimensions of sustainability that contribute to a shared and integrated purpose within sustainability education (MoE, 2022, 2024; Mulligan, 2018; Osman et al., 2017). This conceptualisation challenges the dominance of political and economic rationales that shaped education in the late twentieth century, such as those evident in, *Lifelong learning for all* (OECD, 1996), which positioned education primarily as a mechanism for human capital development. In contrast, the sustainability lens foregrounds holistic learning, democratic participation, and collective wellbeing, reframing education as a transformative force for addressing real-world challenges. This aligns with Weil's (2016) advocacy for 'solutionary-focused' education, which prioritises meaningful, action-oriented learning and equips students to engage in problem-solving for social and environmental issues.

Within the case study school, embedding sustainability in the curriculum began with critical self-reflection. Teacher participants were encouraged to examine their values, attitudes, and beliefs about the world and their role within in it, an essential precursor to transformative practice (Murray, 2011). This reflective process was paired with a deepening understanding of sustainability across environmental, social, cultural, and economic dimensions (Taylor et al., 2015; Walshe, 2008). The magnifying glass in Figure 8 symbolises this process of clarity and critique, drawing attention to the need for teachers to evaluate curriculum choices critically and ensure that sustainability is integrated as a transformative educational lens rather than treated as an add-on. The interconnection of these elements is captured in the petals of the flower metaphor, illustrating how sustainability becomes woven through teaching practices at multiple levels.

Preparing for a World Worth Living In: Lifeworthy and Democratic Education

Extending this perspective, Perkins' (2016) concept of *lifeworthy learning* reinforces the integration of sustainability into the curriculum by highlighting the importance of education that remains meaningful and relevant throughout life. Similarly, Wals (2016) positions sustainability as both a catalyst for educational innovation and a core purpose of education itself. He argues that education should equip learners not only with knowledge but with the capacity to respond thoughtfully and compassionately to complex global challenges. Central to this vision is the development of citizens who are analytical, empathetic, and socially responsible, individuals who value compassion for both human and non-human others and who are committed to the wellbeing of present and future generations.

This orientation resonates with Kemmis' (2022) conception of education's dual purpose: to arrange learning in ways that enable people to "live well in a world worth living in" (p. 21). Biesta (2022) extends this idea, through his emphasis on democratic education, which confronts the fundamental question of how we coexist as human beings within, and alongside, both the natural and social worlds. In this sense, sustainability education is inherently ethical and civic, preparing learners not only for work but for active participation in creating and sustaining a shared, just, and sustainable future.

Reconsidering the Purpose of Education: A Transformative Approach

With the gradual release and implementation of the refreshed New Zealand Curriculum, it is timely to reconsider the purpose of education and how it is enacted in classroom practice. Sustainability education, as explored in this study, fosters meaningful engagement with the world by encouraging critical thinking, ethical responsibility, and a sense of agency among students. This aligns with Biesta's (2017) concept of subjectification, which he defines as a process of, "arous[ing] the desire in another human being for wanting to exist in a grown-up way" (p. 17). Rather than positioning education as a means of producing individuals who conform to economic or political systems, this concept emphasises cultivating independent thought, responsibility, and democratic participation. In the context of sustainability education, this means empowering students to engage with environmental and social challenges in transformative ways, rather than passively consuming knowledge. Biesta's (2016) related critique of consumer-driven education, where learners are shaped by capitalist logic and encouraged to fulfil desires through external gratification, further highlights what sustainability education must resist. In this context, sustainability education empowers students to engage with environmental and social challenges in transformative ways, rather than passively consuming knowledge. As this research demonstrates, such an approach invites both teachers and students to reconsider their values, beliefs, and roles in shaping a more just and sustainable world. The case study school illustrates how an engaged, reflective approach to curriculum design can nurture future citizens who are ethically aware and committed to sustainability.

Summary of Part Two: Conceptualising Sustainability Education

This section has shown that sustainability can serve as an essential lens for curriculum design, guiding both educational philosophy and teaching practice. Through metaphors such as the flower and magnifying glass, sustainability education is conceptualised as a holistic, participatory, and transformative process. Teacher's reflections on their own values and commitments, together with their efforts to integrate sustainability across all learning areas, form the foundation of this shift. Findings from the case study school demonstrate that sustainability education extends beyond the classroom, developing engaged, responsible, and critically aware citizens. Furthermore, the case study indicates that, through professional learning, teacher participants developed the confidence,

language, and collective agency needed to embed sustainability as both a guiding framework and a transformative goal for the future of education.

Summary of Practice Transformation

To address the research question, *How can professional learning and development support primary school teachers in Aotearoa New Zealand to embed sustainability education into their teaching practice and local curriculum design?,* this study used the Theory of Practice Architectures (TPA) as a guiding analytical framework. The TPA enabled a critical examination of:

- how sustainability and sustainability education were understood within the case study school;
- the sayings, doings, and relatings that constituted teacher participants' practices;
- the cultural-discursive, material-economic, and social-political arrangements that enabled or constrained the SELCD PLD; and
- how the professional learning process shaped both curriculum design and classroom pedagogy.

Part One of this chapter explored how these practice architectures influenced teachers' professional learning and the embedding of sustainability within the local curriculum. The cultural-discursive, material-economic, and social-political arrangements established shared meanings and language for sustainability; the material-economic arrangements reflected the school's structures, resources, and time for enactment; and the social-political arrangements shaped collaboration, leadership, and agency. Together, these interrelated dimensions demonstrated that teachers' professional learning was socially, materially, and discursively constituted.

Part Two of the chapter extended this analysis by conceptualising sustainability education through metaphor and theory. Using the flower and magnifying glass as conceptual tools, sustainability education was reimagined as holistic, participatory, and transformative; a process that fosters critical reflection, ethical responsibility, and collective agency. These perspectives position sustainability as a guiding educational purpose that connects curriculum, pedagogy, and community, rather than an isolated topic.

Ultimately, applying the TPA framework illustrated the changes required to transform practice and the conditions that make such transformation possible. The findings show that enduring educational change occurs when professional learning aligns with the social, material, and discursive realities of teachers' work. Recognising the interdependence of discourse, activity, and relationships, and connecting these to broader ethical and ecological purposes, creates the foundation for long-term, contextually grounded transformation in sustainability education.

CHAPTER EIGHT

Making it Bespoke: A Context-Specific, Place-Responsive Model for Sustainability Education PLD - Conclusion and Implications

At the beginning of this thesis journey, I set out to scope the possibilities and potentialities of Aotearoa New Zealand primary schools embedding education for sustainability in curriculum design and practice. To further my understanding, I investigated how teachers could be supported through professional learning and development (PLD) to integrate sustainability education into their teaching practice and local curriculum design. This was necessary to address the disconnect evident in the literature, that reports teachers have limited knowledge and confidence when it comes to teaching sustainability, that they are unsure of what resources to use or how to access them, and that varying levels of importance is placed on Education for Sustainability (EfS) (Bolstad & Durie, 2024; Bolstad et al., 2015; Eames et al., 2009; Lockley, 2018).

The research followed a critical participatory action research (CPAR) approach, progressing over three iterative phases of data collection, analysis, and exploration. These phases examined different aspects of sustainability education in the school, leading to a greater understanding of the organisational arrangements for PLD that enable or constrain sustainability education practices. Insights were gained through engaging with teacher participants, evaluating PLD initiatives, and observing how sustainability themes and pedagogy were implemented in classroom practice and local curriculum design. This collaborative and phased approach revealed how PLD informed both educational practices and curriculum development in the case study school.

This chapter concludes the research journey by presenting a bespoke model for sustainability education and local curriculum design (SELCD) PLD, developed as a pragmatic response to the overarching research question: *How can professional learning support teachers to embed sustainability education in their teaching practice and local curriculum design?* It examines the role of practice architectures (PA), drawing on the frameworks of Kemmis et al. (2014b) and Kemmis (2022), to understand the reciprocal influence between organisational arrangements and teaching practices. Specifically, PA served as an analytical framework within the critical participatory action research (CPAR) methodology, offering a structured lens through which to examine how teachers' professional learning was shaped by site-specific arrangements and, in turn, influenced the broader educational and organisational contexts. This integration of PA within CPAR not only enriched the analysis but also reinforced the methodological coherence of the study. The effectiveness of CPAR as a method for fostering participant engagement is also critiqued in this chapter. By positioning teacher participants and school leaders as co-researchers, the CPAR methodology ensured their

input guided the content, delivery, and context-specific nature of PLD for sustainability education and local curriculum design. This reflective critique offers valuable insights into the strengths and challenges of using participatory approaches in professional learning research.

Arrangements for Professional Learning and Development in Aotearoa

Typical Model of Teacher PLD in Aotearoa New Zealand Primary Schools

The findings of this study suggest that embedding sustainability education into everyday teaching practice requires collective engagement across the school, often termed a *whole school approach* (Eames et al., 2009; Tilbury & Wortman, 2005; Wals et al., 2024; Wals & Mathie, 2022). To meet teachers' needs effectively, sustainability education and local curriculum design professional learning and development (SELCD PLD) must be tailored to the unique dynamics of each school community, rather than applied uniformly as an off-the-shelf package. As Grootenboer and Edwards-Groves (2023) highlight, this approach demands attention to site-specific conditions and arrangements, ensuring PLD is responsive to the unique needs of each school.

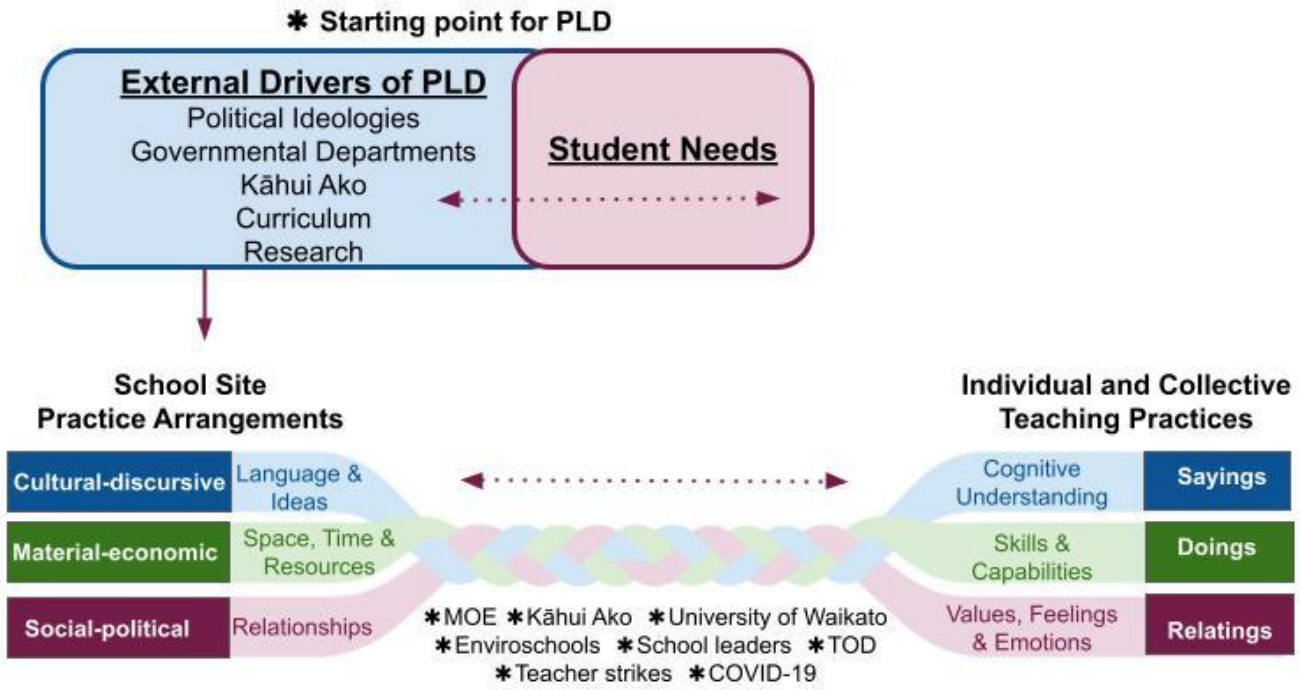
Figure 11 provides a visual representation of the typical PLD model in Aotearoa New Zealand schools, a model that is top-down in its approach and is not responsive to the learning needs or the local context. This structure positions PLD as a mechanism for implementing centrally defined priorities rather than as a process of collaborative, context-driven learning. In this model, professional development is driven by external mandates linked to educational priorities and funding decisions from the Ministry of Education's (MoE), shaping both the focus and facilitation methods used. This influence flows directly into the topics and facilitation methods used in teacher professional development. However, Charteris et al. (2024) note, the principals they interviewed expressed concerns about this top-down approach, arguing it often fails to account for the specific contexts and needs of individual schools. Similarly, Grootenboer and Edwards-Groves (2023) contend that government-mandated initiatives, such as curriculum reform and new policies, often overlook local conditions and constraints, rendering their impact as "restrictive" (p. 37). This model of professional learning does not adequately consider the knowledge, experiences, and expertise that teachers bring with them to their practice, nor does it sufficiently leverage teachers' insights into their own school communities.

In Figure 11, the dotted lines represent areas that may or may not be factored into PLD priority setting, such as considering student needs, while a solid line indicates direct influence. This distinction highlights the variability in how student needs are prioritised within the existing PLD structure. External drivers also directly shape school practice arrangements, influencing the language, ideas, and structure of time, frequency, and activities in the PLD sessions, as well as decision-making processes, relationships, roles, and social interactions that impact engagement in PLD. A dotted line connects school practice arrangements to the individual and collective teaching

practices, suggesting that, in this model, PLD may have varying impacts on teachers' thinking and understanding, skills and actions, values, and interactions. The three-strand rope represents the interconnected influence of PLD on various dimensions of teaching practices, showing the embeddedness of school practice arrangements within the PLD process, in the intersubjective space. Below the braided rope, additional influences on PLD in the case study school are listed, each bearing on the school practice arrangements and ultimately affecting teaching practices. This model highlights potential shortcomings in meaningfully addressing the needs of teachers, particularly in areas where PLD lacks flexibility to fully incorporate teachers' contextual insights, lifeworld experiences, and student-centred priorities and is indicated with a connecting arrow from external drivers rather than from individual and collective teaching practices.

Figure 11

Current Model of PLD in Aotearoa New Zealand Primary Schools



Note. MoE = Ministry of Education, TOD – Teacher Only Days

Crowded PLD Space and Pressure for Fast-Paced Change

This study has raised important questions about the nature of professional learning in Aotearoa New Zealand, where schools lack a clear set of guidelines to follow. The introduction of Kāhui Ako (communities of learning) in 2015 "as part of a government educational improvement policy, Investing for Educational Success (IES)" (Dibben & Youngs, 2022, p. 12), offered opportunities for collaboration with training providers toward shared achievement goals (MoE, 2025b). In the case study school, however, this work was still being established, and its future is now uncertain following the government's removal of Kāhui Ako.

Throughout the research, it became evident that the volume of PLD initiatives significantly increased teachers' cognitive load. The rapid pace of change and ongoing expectation to revise and adapt knowledge often left teacher participants feeling overwhelmed (Charteris et al., 2021). To align with the Ministry of Education priorities and implement programmes such as: Positive Behaviour for Learning (PB4L), Better Start Literacy Approach (BSLA), Developing Mathematical Inquiry Communities (DMIC), Enviroschools, and Te Reo Māori courses, among others, teacher participants found their professional learning focus fragmented.

Embedding sustainability education school-wide, requires specific, relevant, and ongoing PLD. Although progress has been made since Bolstad et al. (2015), including online resources and increased discussions through forums such as the New Zealand Association of Environmental Education (NZAEE), teachers still need support to understand sustainability, its pedagogy, and its role in the curriculum. Fast-paced change often leaves little room for the sustained and focused professional development required to embed sustainability education into teaching practices and the wider curriculum. Teacher participants echoed this, expressing a need for continued support coaching, mentoring, and classroom observations following two terms of SELCD PLED. These challenges prompted the development of a bespoke model for SELCD PLD.

A Bespoke Model for SELCD PLD

Overall, this study reinforces that embedding sustainability education school-wide requires bespoke SELCD PLD. Figure 12 illustrates the model developed in response to challenges such as limited teacher knowledge and confidence, lack of resources and exemplars, and insufficient opportunities for contextually relevant professional learning. The model begins with understanding context and acknowledging the influence of individual and collective teaching practices.

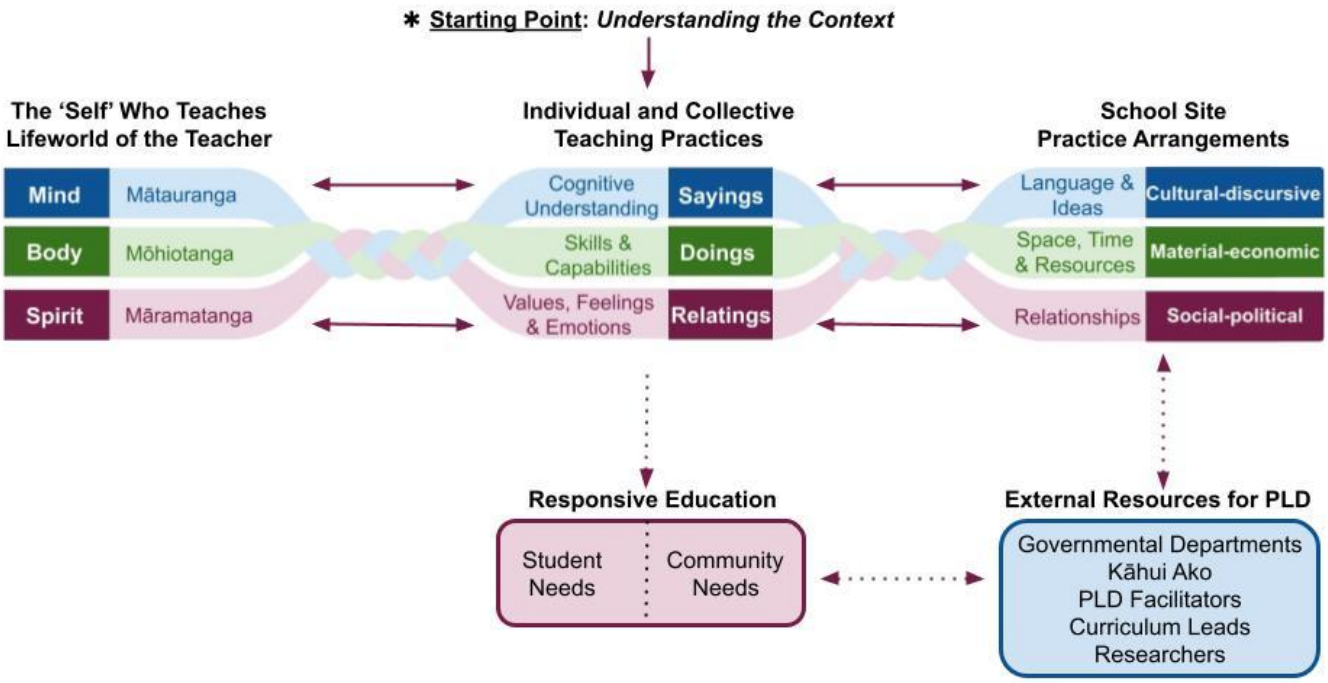
Central to this model is recognition of the teacher's lifeworld as a key factor shaping practice. Edwards-Groves et al. (2010) suggest that lifeworlds contribute to a school's practice architectures. While existing frameworks often imply this through practitioners' sayings, doings, and relatings, this model explicitly foregrounds it, recognising teachers' personal and professional realities as integral to effective PLD. It also acknowledges the interconnections of mind, body, and spirit reflected in teachers' holistic engagement with sustainability education and Indigenous perspectives. This

understanding draws on Meyer's (2013) holographic epistemology, in which knowing is relational and embodied, integrating physical, intellectual, emotional, and spiritual dimensions of experience. Through this lens, teachers' knowledge and experiences are understood as interconnected, each part contributing to the whole.

These interconnections are shaped by broader school practice arrangements that can enable or constrain professional learning. As Charteris et al. (2024) observe, school systems often shape, or even 'colonise', teachers' lifeworlds, influencing how they navigate professional and personal roles. The dotted lines in the model represent these dynamic and context-specific relationships, emphasising the need for PLD designs that align with teachers' lived realities and foster meaningful engagement.

Figure 12

Model for Bespoke SELCD PLD



Note. Mōhiotanga = basic knowing, understanding, new knowledge, insight from direct experiences; Mātauranga = deeper understanding, wisdom, and growth when dealing with new ideas; Māramatanga = alignment of knowing, understanding new knowledge, it all connects and brings understanding, insight, clarification, and enlightenment.

Positioning the SELCD PLD Model within the Professional Learning Landscape

In Chapter Two, this thesis examined the wider ideologies and global discourses that influence education, environmental education, and sustainability education. These included neoliberal and market-oriented approaches (Codd, 2008; Klees, 2020; Savage, 2017), alongside global frameworks such as The United Nations' concepts of *Sustainable Development* (SD), and *Education for Sustainable Development* (ESD). While these international agendas have advanced awareness of sustainability, they have also been critiqued for their contested and sometimes contradictory meanings (Bourn, 2015; Le Grange, 2017; Sterling, 2001).

As discussed in Chapter Two, these global frameworks are situated within a broader political landscape shaped by neoliberal ideologies that prioritise economic growth, competition, and accountability metrics in education (Codd, 2008; Savage, 2017). Within this environment, sustainability education is often reframed through instrumental outcomes-driven lenses that risk diluting its ethical, cultural, and ecological dimensions (Klees, 2020, Ruth, 2018). Such policy settings can constrain teachers' autonomy and narrow opportunities for critical, place-responsive practice. Consequently, there is a growing recognition that meaningful change in sustainability education must begin with the teachers and their experiences, beliefs, and relationships to place, rather than with global prescriptions. This orientation aligns with calls for professional learning that empowers educators to negotiate global discourses in locally relevant and relational ways.

The bespoke SELCD PLD model developed in this research responds to these tensions by offering a localised, relational, and context-responsive approach to professional learning. Rather than aligning with generic, outcomes-driven models of PLD, it emphasises teachers' lived realities, community relationships, and the conditions that enable meaningful change. In doing so, it answers calls from Biesta (2017), Robinson (2010), and Wals (2015) to reframe education as a transformative process that prepares learners, and teachers, for lifeworthy and sustainable futures.

This model positions teachers' lifeworlds at the centre of professional learning, recognising the personal, professional, and contextual factors that shape practice (Edwards-Groves et al., 2010). By explicitly valuing these lived dimensions, it aligns with participatory, place-responsive approaches advocated by Bolstad et al. (2015), Penetito (2009), and Wals and Mathie (2022). It also reflects Aotearoa New Zealand's bicultural context, intentionally weaving together multiple knowledge systems, including Mātauranga Māori and Western perspectives, in line with Te Tiriti o Waitangi commitments (Macfarlane et al., 2024; Tolbert et al., 2024).

The SELCD PLD model offers a pathway for embedding sustainability education that is pedagogically robust, culturally responsive, and contextually relevant. It demonstrates how professional learning, when designed around teachers' realities and supported through collaborative and relational practices, can cultivate a shared commitment to sustainability across the school community.

Context Specific SELCD PLD: Multiple Knowledge Systems

A key argument developed throughout this thesis is the necessity for a bespoke model for teacher professional learning. SELCD PLD must be context-specific, aligning to the cultural-discursive, material-economic, and social-political arrangements for teacher SELCD PLD (found in the ideas, organisation, and roles) and with the specific circumstances of the school and its local area. This approach carries significant implication in Aotearoa New Zealand, where Indigenous knowledge (Mātauranga Māori) is interwoven into the nation's identity and has gained prominence in education research and literature over the six years of this research project (Glassey, et. al., 2023; Saha et al., 2023).

The inclusion of 'culture' as one of the four interdependent aspects of sustainability on Tāhūrangi, Aotearoa New Zealand's online curriculum hub (MoE, 2022b, 2024), further supports this focus. Many educators and researchers are now emphasising the importance of incorporating local mātauranga into sustainability Kaupapa. The braiding together of Indigenous and non-Indigenous knowledge streams, as guided by He awa Whiria approaches (McCaw, 2022; Macfarlane et al., 2024), presents opportunities to develop culturally responsive teaching practices and create inclusive learning environments within SELCD. Similarly, Tolbert et al. (2024) advocate for integrating multiple knowledge systems into local curricula, highlighting how such approaches can foster students' "inventiveness, empathy, and epistemic agency" (p. 1).

For Mātauranga Māori to be meaningfully integrated into education, Te Tiriti o Waitangi obligations must be upheld. This ensures that Māori retain tino rangatiratanga, or sovereignty, over their knowledge. As Eames et al. (2024) explain, while some mātauranga is available through public sources, authentic engagement depends on building trusting relationships with local hapū and iwi. Consequently, the onus is on teachers and schools to nurture these connections, rather than presuming access to Indigenous knowledge. This takes time and requires the school leadership team to actively foster such relationships within the structure, arrangements, and practice architectures of the school. Furthermore, it should influence selection of SELCD PLD facilitators to ensure the PLD will be tailored to their local Aotearoa New Zealand context, where knowledge systems are not only acknowledged but also braided together in the content, structure, and delivery of the SELCD PLD.

Implications for SELCD PLD

Using a Practice Architectures Framework

The practice architectures framework as a tool for analysis (Kemmis et al., 2014b; Kemmis, 2022), combined with tables of invention to analyse the SELCD practices (Kemmis & Mutton, 2012), provided a comprehensive lens for examining the reciprocal influences between organisational arrangements and teaching practices. These tools highlighted how the practice arrangements in the

case study school both enabled and constrained sustainability and local curriculum design and SELCD PLD, as outlined in Table 22. They also revealed the intricate connections and interactions between SELCD practice development, within the intersubjective space where the team collaborated, and the school's broader practice arrangements that supported the PLD.

While the framework allowed for a detailed understanding of these dynamics, this research has highlighted that achieving a sustained impact requires a deeper, site ontological approach. As Grootenboer and Edwards-Groves (2023) argue, this involves investigating the "distinctive site-based conditions" (p. 37) that shape teachers' practices and the ways PLD is experienced. Such insights strengthen the case for embedding SELCD within site-specific ontologies, ensuring school practice arrangements are not only responsive and customised but also capable of driving meaningful, lasting change. Although this research encouraged teacher participants to reflect on the practice architectures and arrangements within their school site, further studies specifically focused on how these arrangements are transformed to support sustainability education and local curriculum design would provide valuable insights.

Table 22

Arrangements that Enabled and Constrained SELCD PLD

Practice Architectures	Arrangements that *enabled* SELCD PLD	Arrangements that *constrained* SELCD PLD
Cultural-discursive Arrangements	• The team requested SELCD PLD to include local area learning. • The facilitator tailored SELCD PLD to the local context, incorporating Indigenous knowledge. • Collaboration with local iwi enriched understanding of the area's history.	• Multiple PLD providers introduced diverse ideas, dividing focus and increasing teachers' cognitive load. • The PLD facilitator had limited connections to local iwi, being from another region. • Pre-planned learning themes for the year limited teachers to trying out PLD ideas, delaying full engagement in SELCD planning until the following year.
Material-economic Arrangements	• The principal accommodated SELCD PLD sessions alongside other scheduled PLD. • Two terms of SELCD proved more effective than a single session. • The facilitator's knowledge of sustainability enabled practical and relevant SELCD PLD, which teachers could immediately apply using sustainability education pedagogy, frameworks, and resources.	• The PLD space was crowded with diverse topics and facilitators. • Several PLD sessions were rescheduled or cancelled due to staff illness and Covid-19. • The teachers preferred whole-day PLD over after school sessions, but call-back days and teacher-only days were already scheduled for the year.
Social-political Arrangements	• The team valued learning together and recognised the benefits of collective PLD. • The critical participatory action research methodology empowered teachers to shape SELCD PLD to their needs. • Opportunities to input into the vision of the school and their own professional learning was appreciated by teachers.	• Decisions rested with the principal, limiting changes proposed during focus group sessions. • The principal missed some of the PLD and focus group sessions, including the final one after extensive PLD and teaching. • Teachers suggested ongoing SELCD PLD, including planning support, observations, and coaching, which the deputy principal relayed to the principal.

Limitations of Using a Practice Architectures Framework

The practice architectures (PA) framework provided a valuable lens for analysing the conditions shaping SELCD PLD. It was instrumental in identifying the cultural-discursive, material-economic, and social-political arrangements that influence sustainability education within the school. However, while PA helped reveal the conditions that enable and constrain practices, it did not provide a structured pathway for enacting change. Identifying practice arrangements was essential, but without a clear mechanism for intervention, sustained transformation remains challenging. This study demonstrated that while PA can help to identify issues within existing practice architectures, it does not inherently offer a process for implementing changes.

Another limitation of PA is its highly context-dependent nature, which can make it difficult to apply beyond the specific research setting. Although the framework supports examination of local practice arrangements, it does not fully account for the broader systematic inequalities such as government policies and neoliberal pressures on education. As discussed in Chapter Two, these global and political forces influence education systems through market-oriented ideologies, performative accountability, and outcomes-driven reforms (Codd, 2008; Klees, 2020; Savage, 2017). Within these policy environments, sustainability education can become instrumentalised, valued more for its contribution to economic productivity or social cohesions than for its ethical or ecological imperatives (Bourn, 2015; Le Grange, 2017). These institutional forces can shape and constrain sustainability education in ways that go beyond what teachers and school leaders can influence at the institutional level. Consequently, while PA enables insight into the immediate cultural-discursive, material-economic, and social-political arrangements of a school, it offers limited analytical traction on how these sit within the wider political economy of education introduced in Chapter Two. While PA acknowledges power relations within social-political arrangements, it does not provide explicit strategies for addressing these larger structural barriers.

At the end of Chapter Seven, emphasis was placed on how the use of the PA framework revealed not only the changes required to transform practices but also the conditions that enable such changes. Extending this analysis, it becomes clear that local practice transformation must also be considered alongside the broader policy and ideological contexts discussed in Chapter Two. The systemic influences of neoliberal governance, performativity, and policy reform intersect with school-level practices, shaping what is possible within teachers' professional realities. For schools to meaningfully integrate SELCD into their curriculum and planning, the three interdependent dimensions of practice architectures - discourses and language; activity and work; and solidarity and power - must be transformed both within the practice architectures and the practices themselves. However, achieving such transformation requires additional mechanisms beyond what PA offers, particularly when addressing systemic constraints and external policy pressures, such as the competitive structure of Aotearoa New Zealand's education system, changing education priorities

(which goes hand in hand with changing professional development priorities), and a national curriculum that, at the time of writing, was still in development. Additional systemic pressures, including constraints on teacher time, accountability demands, resourcing limitations, and variability in staff expertise, further complicate efforts to meaningfully embed sustainability and local curriculum initiatives within schools.

Distinctive Site-based Conditions for SELCD PLD

Following Kemmis et al. (2014b) and Biesta's (2017) assertion that education must be understood as greater than just learning, this study examined how site-based conditions and practice arrangements shaped the SELCD PLD within the case study school. While the PLD primarily aimed to develop teaching practices associated with sustainability education, the research process also influenced the professional learning practices. Initial interviews explored staff perceptions of sustainability education, including its defining characteristics and how it was conceptualised within the school. These conversations also highlighted teacher participants' preferences for the structure, delivery, and content of professional learning, providing a foundation for the follow-up interviews. Engaging with the teaching team fostered their growth as a learning community, enabling shared understandings and practices (Kemmis et al., 2014b).

Schatzki (2000, 2012) proposes that practices are embedded in site specific *practice-arrangement bundles*, where cultural, material, and social resources interact to shape, though not dictate, how traditions and social actions evolve. Understanding these site-specific practice arrangements and their impact on teachers' engagement with sustainability education is crucial for tailoring PLD to the needs of a school (Kemmis et al., 2014b). As Kemmis and Edwards-Groves (2018) argue, learning is inherently tied to practice, evolving as individuals participate in and transform practices. Participation in SELCD PLD, therefore, becomes not just a means of learning new content but an opportunity to shape and reimagine the practices that underpin sustainability education in meaningful and context-specific ways. This emphasises the importance of SELCD as a collaborative, context-sensitive process, where teachers and schools co-construct practices that reflect both local realities and broader educational goals. For SELCD PLD to succeed, schools must commit to understanding and leveraging their distinctive site-based conditions, ensuring professional learning aligns with and enhances their unique educational landscape.

Research Process Reflections: Critical Participatory Action Research

Strengths of Using CPAR as a Methodology

Critical participatory action research (CPAR) proved essential in developing the SELCD PLD model (Figure 12) by enabling the process to be tailored to the specific needs and context of the case study school. Rather than being represented in the figure itself, CPAR informed the iterative and collaborative inquiry through which the *Model for Bespoke SELCD PLD* emerged. This approach

facilitated an in-depth examination of the processes, structures, and content of professional learning and development (PLD) for the teacher participants.

By involving teachers and school leaders as co-researchers, CPAR fostered ownership of the process and acknowledged the context-specific nature of change-focused interventions (Feekery, 2023; Munn-Giddings, 2017). Their active participation ensured that teacher participants' sayings, doings, and relatings of practice, and the realities of their lifeworlds, co-constructing the design, content, and delivery of the SELCD PLD. In doing so, CPAR enabled a fuller understanding of the practice arrangements that both enables and constrained professional learning in the case study school.

A key strength of using CPAR as a methodology is its flexibility and responsiveness (Cornish et al., 2023). Before initiating SELCD PLD, Phase One of CPAR aimed to understand the characteristics of sustainability and how sustainability education was conceptualised in the school site. A mutual understanding of teacher participants' needs and preferences, including what they wanted to learn and how they preferred to engage in PLD (such as frequency, style), was sought using individual interviews and focus group discussions. Across the three iterative phases of the research, additional focus groups and individual interviews offered reflective opportunities, enabling teacher participants to become co-producers of local knowledge, which they could integrate into their teaching practice and the school practice arrangements (Cachelin et al., 2016; Erickson, 2013).

This collaborative approach to SELCD PLD encouraged relevance and applicability. It increased the likelihood that the PLD would meet teacher participants' needs and be effectively transferred into practice. The iterative and dialogic nature of this research exemplified Feekery's seven key characteristics, known as the '7 C's of PAR': it was cyclical, collaborative, context-specific, critically reflective, combining theory and practice, change-focused, and conversation-driven (Feekery, 2023). This alignment highlights the study's adherence to CPAR methodology and its potential for fostering practical, meaningful, context-specific, and lasting change.

Another strength of CPAR is its cyclical nature. In this study, each of the three CPAR phases was guided by a specific research question, which shaped both the generation of knowledge and the implementation of actions in a collaborative and democratic process consistent with the principles discussed by Vaughn and Jacquez (2020). The use of CPAR in Phase Two of the research, which evaluated sustainability PLD and synthesised how practice arrangements in the case study school might enable SELCD, highlighted how the SELCD PLD and the reflective nature of CPAR lead to changed perspectives of sustainability education, local curriculum, and ongoing thoughts about curriculum design. A conclusion which was also drawn by Wagle (2023) during a CPAR project in a Nepalese school. The findings of this research provide insights into ongoing design of SELCD PLD,

as it highlighted the need to explore the values linked to sustainability education, introduce sustainability pedagogy such as action competence and head, heart, and hands holistic learning, investigate and use supporting frameworks and resources, engage with local organisations and local knowledge, and promote problem-solving and critical thinking.

Limitations of Using CPAR as a Methodology

Several authors have highlighted the challenges and limitations of using a critical participatory action research (CPAR) methodology in social research (Australian Institute of Family Studies [AIFS], 2015; Feekery, 2023; Walter, 2009; Wimpenny & Savin-Badin, 2012). These challenges include:

- The time-consuming nature of CPAR, which depends on participant involvement;
- The production of large amounts of data, which may be difficult to manage;
- The need to ensure all voices are heard;
- The importance of creating a shared communication space;
- The difficulty of ensuring the research is meaningful outside the context; and
- The challenge of replicating CPAR projects in other settings.

Despite these challenges, the findings from this study support the use of CPAR as a methodology. Table 23 outlines how the suggested limitations of CPAR were mitigated during the 11-month research period.

Table 23

How CPAR Limitations were Mitigated in this Case Study

CPAR Limitation	Mitigated in Research
CPAR is time-consuming and depends on the involvement of the teacher participants.	To address the time-intensive nature of CPAR, we ensured ongoing commitment from senior leadership and teaching staff. An extended timeline allowed for deeper engagement and commitment from the school.
Large amounts of data are produced that may be difficult to manage.	The challenge of managing large amounts of data was mitigated by recording, transcribing, and summarising key themes from interviews and focus groups, then collaboratively making informed decisions.
The need to ensure all voices are heard.	Although not all participants attended every session, the whole team was involved across interviews and focus group discussions, ensuring that all perspectives were represented and contributed to the decision-making process.
The importance of creating a shared communication space.	In response to the need for a shared communication space, meetings were held in the staffroom, a familiar environment, with all teacher participants seated in a circle. Contributions from everyone were encouraged.
CPAR projects may be difficult to replicate.	By creating a bespoke model for SELCD (Figure 12), the project overcame replicability challenges, paving the way for adaptation in other schools.

A notable limitation of the CPAR methodology is the assumption that decision-making is equally shared among teacher participants. In this study, this balance was achieved during Phases One and Two of the CPAR process. However, in Phase Three, new and further actions could not be taken immediately because the principal was not present, limiting the capacity for immediate school-wide changes. The symbolic power of the principal highlights the challenge of replicating the research in a similar context as his absence had an impact on decision making. Nevertheless, as Kemmis and McTaggart (2005), suggest, the success of CPAR is not determined by teachers' strict adherence to a set of steps but by their genuine sense of progress in their practices, their understanding of those practices, and the contexts in which they are applied. This perspective reinforces the value of the progress made during the study, even amidst power-related challenges.

The findings also suggest that practice development was strengthened through the CPAR process and the practice arrangements that supported SELCD PLD. While CPAR can support site-specific projects addressing both human and social problems, its context-specific nature can also be considered a limitation, as noted by Cornish et al., (2023), who caution that such research is often seen as "niche" (p. 9). To address this, this study employed the practice architectures framework (Kemmis, 2022; Kemmis et al., 2014b), which placed the focus on the cultural-discursive, material-economic, and social-political arrangements that enable and constrain SELCD PLD, as well as the sayings, doings, and relatings of practice. The bespoke model for SELCD PLD (Figure 12) is a direct outcome of this framework and offers a practical tool that schools can use to support SELCD PLD planning and delivery.

Implications for Further Research

This research highlights numerous opportunities for future exploration in the field of sustainability education and local curriculum design. While this study primarily examined the professional learning and development (PLD) space that supports teachers' practices and understanding of sustainability education, a greater focus on school site arrangements would enhance these findings. Further case studies using the practice architectures framework to develop bespoke SELCD PLD models could provide valuable insights into how school contexts influence PLD outcomes.

Additionally, further research could explore the efficacy of coaching and mentoring individuals and teams in sustainability education and curriculum design. A grassroots and individualised approach, supported by the bespoke model for SELCD PLD, could investigate classroom practices in depth, providing immediate feedback and tailored support to teachers.

Another critical area for exploration is the long-term implementation of SELCD PLD. During CPAR cycles in Phases Two and Three of the research, the teacher participants frequently expressed concerns about sustaining implementation efforts. One promising strategy is integrating SELCD PLD into ongoing curriculum design planning meetings. A longitudinal study following a school team

through a year of planning and supporting them to integrate SELCD into the curriculum could offer valuable insights into sustainability-focused curriculum practices. This aligns with the site-ontological approach advocated in this research, emphasising the transformation of practice architectures and the conditions that enable such changes.

By addressing these areas, future research can further advance the integration of sustainability education into local curriculum, supporting both theoretical development and practical application in school contexts.

Final thoughts

Education is vital for creating informed and compassionate individuals who can lead, advocate, and collaborate to protect socioecological systems and promote planetary health amidst significant global challenges (White et al., 2024). Education for sustainability, therefore, is critical as humanity faces interconnected global challenges, including climate change, resource misuse, and disintegrating ecosystems. Sustainability education fosters critical thinking, ethical decision-making, and holistic competencies, empowering students to reconnect with the natural world and develop solutions for a more equitable and sustainable future (Marschall & Crawford, 2022; Osman et al., 2017; Taylor et al., 2015). This transformational approach to learning embodies what Perkins (2016) describes as *lifeworthy* education, addressing urgent social, environmental, and economic issues while challenging dominant narratives of consumption and materialism (Taylor et al., 2015; Walshe, 2008).

Embedding sustainability into everyday teaching practice requires educators not only to grasp its complex and nuanced nature, but also have access to the necessary resources, skills, and confidence to teach it effectively. Professional learning initiatives like bespoke SELCD PLD are crucial for supporting educators re-envision curriculum through a sustainability lens. Such initiatives facilitate the integration of global frameworks, such as the United Nations Sustainable Development Goals (UNESCO, 2017), and promote holistic models like the *head, heart, and hands* approach (Gazibara, 2013; Singleton, 2015; Sipos et al., 2008), which provide teachers with practical tools and conceptual resources for embedding sustainability meaningfully in their teaching.

By aligning sustainability with local issues and fostering student agency, teachers can embrace a pedagogy of hope, a concept rooted in Freire's (1992) assertion that hope must be anchored in practice, a position also held by Le Grange (2011), and Taylor et al. (2015). Choosing to be part of the work of restoration, whether at the level of individual students or the collective education system, is an act of hope. As articulated by Vargo (2021), repair and reconciliation begin with an acknowledgement of what currently is and a vision of what could be. This process, much like sustainability education itself, is both a hopeful invitation and an ongoing necessity, offering the potential to make restoration a part of the way we live. By embedding these principles into

sustainability education, teachers and students can be empowered to see themselves as active teacher participants in the restoration and renewal of socioecological systems.

Friere's (1992) assertion that hope must be anchored in practice resonates with this study's findings, particularly the need for students and teachers to actively engage with sustainability challenges we face. Awareness alone is insufficient; education must inspire action and nurture a generation of what Weil (2016) terms as *solutionaries* who innovate and advocate for meaningful change. Grounding this pedagogy of hope in the lived experiences and interactions of teachers and students ensures it does not remain confined to policy documents, academic discourse, or corporate agendas but becomes a catalyst for authentic transformation (Le Grange, 2011).

In this study, SELCD PLD supported teacher participants in re-envisioning their curriculum through a sustainability lens. This aligns with Kemmis (2023) assertion that education serves the dual purpose of individual formation through the development of individual's capacities, dispositions, and understanding, and collective action toward a sustainable future. Stetsenko's (2013a, 2013b, 2019) concept of the *collectividual* which emphasise the inseparable interplay between individual agency and collective responsibility, further highlights the need for professional learning to address both personal and systemic change. By fostering this dual purpose, SELCD PLD equips educators and students alike to contribute meaningfully to "living well in a world worth living in," a vision that Kemmis (2023, p. 13) identifies as both urgent and transformative.

To end this chapter, I will leave a whakataukī for pondering,

Tukua ke tua,

Ki ngā rā o te waru e

Leave it for the future, for the days when food is scarce.

Alsop and Kupenga (2016) relate this whakataukī to manatiaki (stewardship), and it was used during the SELCD PLD sessions. It speaks of leaving a legacy, being future-focused, and thinking about the people who will come after you - future generations. Literally, this whakataukī serves as a reminder to leave (the kūmera) in storage for the future, for the days of the eighth month when food is scarce (during the winter months).

Appendices:

Appendix A: Invitation to Principals to Participate and Information Letter

Letter of Invitation to Participate in Research

25 November 2021

Project Title

Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research

Invitation

Tena koe,

I am directing this invitation to you as principal of your school, inviting you and your team to participate in a unique and exciting research project and PLD opportunity. I am undertaking my Ed.D. though Auckland University of Technology. As part of my Ed.D. qualification, I would like to invite you and members of your staff to participate in my research project to explore a school's professional learning experiences in sustainability education and local curriculum design.

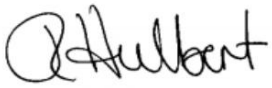
The main purpose of this research project is to understand how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design. This valuable information has the potential to deepen our collective educational understanding of the characteristics of sustainability education, of how professional learning in sustainability education can shape local curriculum design and teaching practice, and how professional learning might be arranged to further enable sustainability education practice to be developed.

The study is designed to be spread over four school terms, beginning in Term 4 2021, with PLD occurring during Term 1 and 2 2022, and concluding in Term 3 2022. As part of the study, I am offering two terms of free school PLD in sustainability education and local curriculum design. The content and structure of this PLD will be determined by data emerging from participant interviews in consultation with a school leaders' focus group. For the last 9 years I have taught Year 3 pre-service teachers a course in sustainability education and during that time have researched widely the pedagogy associated with sustainability education and the resources available to teachers. With one of four Ministry of Education PLD priorities being local curriculum design, this research is well placed to feed into existing dialogue on this important learning area.

You are under no obligation to accept this invitation. However, if you do choose to give your consent, the information gathered from you and your team will help me to gain important answers to the following question:

How can professional learning support teachers to embed sustainability education in their teaching practice and local curriculum design?

Nga Mihi Nui



Rachelle Hulbert

Ed.D. Candidate

School of Education

Auckland University of Technology

What is the purpose of this research?

The purpose of this research is to find out how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design and how insight from this can inform schools wishing to engage in sustainability education and local curriculum design. It also engages with how professional learning can be arranged to better support sustainability education to be enmeshed with responsive local curriculum design.

The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

The school has been identified and invited to participate in this research project because you are based in the Tauranga region. To take part in the research project and PLD, there must be an agreement that teachers are able to be recruited to take part in the research project as co-producers of knowledge (separate to taking part int eh sustainability education and local curriculum design PLD). Separate participant information forms and consent forms have been created for each phase of data collection in the research project.

The research seeks to involve teachers from a single case study school in the Tauranga region. The school must have had some involvement in sustainability education (either through an external organisation or through existing school curriculum design and teachers pursuing avenues of interest). Additionally, the school must indicate a willingness to commit to sustainability education and local curriculum design PLD for the first two school terms in 2022.

In order to participate, participants must be New Zealand registered teachers (provisional, subject to confirmation or full practicing certificates are required). Any teachers who studied at and graduated from Bethlehem Tertiary Institute between 2013 – 2021 will be excluded from participating in this research project due to a conflict of interest with the researcher. Students at the school will not be involved in any aspect of the research as the project is focused on sustainability education and local curriculum design PLD for teachers.

How do I agree to participate in this research?

All participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage your school. Participants can withdraw from the study at any time. If participants choose to withdraw from the study, then they will be offered the choice between having any data that is identifiable as belonging to them removed or allowing it to continue to be used. However, once the findings have been produced, removal of data may not be possible.

Participant's choice to participate in the research project will be given by completing a consent form, which can be found at the end of the information sheet related to each data collection tool. Consent will involve submitting an email address which they can be directly contacted and providing a pseudonym by which they want to be known throughout the written work.

What will happen in this research?

School Leader's Focus Groups: In phase one of the research (PAR cycle one), participants are invited to participate in 2 x 45min – 1 hr focus group sessions to take place during Term 4, 2021. These two focus groups will be used to discuss the findings from the participant interviews and to decide the content and structure of the PLD sessions which will take place during Term 1 and Term 2, 2022. A further two focus group sessions will be held in 2022, one during the PLD at the end of Term 1 and the other at the end of the PLD and after the second round of interviews in Term 3, 2022. The purpose of this last focus group is to discuss the findings from the second round of interviews in order to plan a way forward for sustainability PLD for the remainder of the school year. To participate, teachers will need to give their consent on the form provided. Included on the consent form is space for teachers to provide an email address at which further information related to the research project can be sent, and a space for them to write the pseudonym they wish to be referred to in all written documentation related to this research project.

Interviews:

In phase one of the research (PAR cycle one), teachers are being invited to participate in a semi-structured interview about the characteristics of sustainability education and how you teach sustainability. The interview should take about 30 minutes to complete. To participate teachers will need to give their consent on the form provided. Included on the consent form is space for teachers to provide an email address at

which further information related to the research project can be sent, and a space for them to write the pseudonym they wish to be referred to in all written documentation related to this research project.

In phase three of the research (PAR cycle three), teachers are again being invited to participate in a semi-structured interview about their teaching experiences, focussing on the influence of professional learning and development related to sustainability education and local curriculum design. These interviews will help in understanding how professional learning can be arranged to support ongoing PLD related to sustainability education becoming enmeshed in local curriculum design. The interview should take about 30 minutes to complete. To participate teachers will need to give their consent on the form provided. Included on the consent form is space for teachers to provide their email address at which further information related to the research project can be sent, and a space for them to write the pseudonym they wish to be referred to in all written documentation related to this research project.

Sustainability education and local curriculum design PLD:

I will provide PLD in sustainability education and local curriculum design during Term One and Two of 2022. The content, structure, and frequency of this PLD will be determined by the school leaders focus groups and as a result of the data collected from the first round of participant interviews in 2021. All staff will be involved in the PLD and no data will be directly gathered from these sessions.

Documentary Analysis Focus Group:

In phase two of the research (PAR cycle two), teachers are being invited to participate in a documentary analysis focus group about the planning and teaching of sustainability as a result of PLD in sustainability education and local curriculum design. The focus group should take between 1hr 30 minutes – 2 hours to complete. To participate teachers will need to give their consent on the form provided. Included on the consent form is space for teachers to provide an email address at which further information related to the research project can be sent, and a space for them to write the pseudonym they wish to be referred to in all written documentation related to this research project.

The data gathered during the focus group sessions will:

- Influence the sustainability education PLD that will take place during Term 1 and 2, 2022.
- Influence ongoing sustainability education PLD in the school.
- Be used in the submission of a thesis towards an Ed.D. qualification at Auckland University of Technology.
- Be used in subsequent publications in research books and journals and presentations at conferences related to the topic researched.

What are the discomforts and risks?

There should be minimal potential for discomfort and risk in phase one of the research.

How will these discomforts and risks be alleviated?

During this aspect of the research, the potential discomfort and risk has been alleviated with,

- The choice to participate is that of the participant alone.
- All information provided in the research will be only accessed by the researcher and transcriptionist. All data will be stored in a password protected hard drive when the transcripts have been completed
- In line with Auckland University of Technology data storage protocol, after six years of storage all data on the external hard drives will be deleted. However, any anonymised data such as transcripts may be kept as long as needed to write up research for further publications.
- An email address will be provided, allowing you to communicate concerns at all phases of the research, including risk or discomfort. This research address will be for the primary supervisor of the research project, Associate Professor Leon Benade leon.benade@aut.ac.nz
- In the case of risk or discomfort, counselling and wellbeing support will be provided. AUT Student Counselling and Mental Health offers three free sessions of confidential counselling support for adult participants in an AUT research project. These sessions are only available for issues that have

arisen directly because of participation in the research and are not for other general counselling needs. To access these services, you will need to:

- drop into our centre at WB203 City Campus, email counselling@aut.ac.nz or call 921 9998.
- let the receptionist know that you are a research participant and provide the title of my research and my name and contact details as given in this Information Sheet.
- You can find out more information about AUT counsellors and counselling on https://www.aut.ac.nz/student-life/student-support/counselling-and-mental-health

What are the benefits?

The benefit to the participant

- The immediate benefit is that the data provided will shape the PLD related to sustainability education and local curriculum design.
- It will allow the missing voice of teachers to be heard and contribute to the design of PLD related to sustainability education and local curriculum design.
- Other PLD providers will be able to use the voice that participants provide to design PLD that are better positioned to support the emergence of autonomy, knowledge, and responsibility in line with teaching sustainability and designing local curriculum.
- Participants will see the potential that sharing their voice has within the educational discourse and be encouraged to keep reflecting on and sharing their experiences so that others can benefit.

The benefit to the researcher

- The first benefit is that this project will allow them to grow in their research capability in an educational field about which they are passionate. This will contribute directly to the growth of their academic profile both within educational philosophy and sustainability education research communities, and as a PLD provider and an educator of pre-service teachers.
- The research will develop research skills in methodologies that use sustainability education and participatory approaches in exploring how sustainability is taught and how sustainability PLD is structured and delivered.
- This research contributes towards gaining the Ed.D. qualification.
- The research will assist in the development of sustainability education PLD design within the ITE teaching and learning space at BTI.
- The literature review for this research is contributing toward the B.Ed. (Teaching) Primary degree Approval process at the tertiary provider the researcher works.

The benefit to the community

- This research will add benefit to the educational community in Aotearoa by widening the discourse on sustainability education and local curriculum design in primary school education, giving teachers a voice.
- By assisting a school to support better the development of sustainability education, it is more likely that they will continue to address their community's most pressing needs in their teaching and learning programmes in line with the NZ curriculum.
- The research will add to the continued development of research methodologies that allow missing voices to be explored and contribute to the educational discourse.
- This research will add new insight to the existing body of knowledge on sustainability education and local curriculum design. It will add a focus that represents Aotearoa and our educational community.

How will privacy be protected?

All involvement this research is confidential. Pseudonyms will be used in any written work to protect participant identity though anonymisation.

What are the costs of participating in this research?

Participation in each of the four focus groups should take between 45-minute – 1 hour of time. This will involve discussion and decision making. The four focus groups will be spread out over four school terms.

Participation in the interviews will take 30-minutes in Term 4, 2021 and 30-minutes in Term 3, 2022.

Participation in the documentary analysis focus group will take 2 hours at the end of Term 2, 2022

What opportunity do I have to consider this invitation?

10 working days will be given to consider this invitation. A reminder of this invitation will be sent out before it closes. This will be the same pattern used to recruit teacher participants for each phase of data collection.

Will I receive feedback on the results of this research?

At the conclusion of each phase (PAR cycle), a summary of the findings will be available to participants and discussed with the sustainability education PLD 'leadership focus group'. Findings from the interviews will steer the content, organisation, and structure of the PLD. At the conclusion of the phase three (PAR cycle three) interviews, a summary of the findings will be available again, to participants and discussed with the sustainability education PLD 'leadership focus group'. All transcripts from the focus group discussions will be made available to members of the group to check for accuracy, as will be the summary of findings from all focus group discussions.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Associate Professor Leon Benade*

leon.benade@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Student Researcher

Rachelle Hulbert

r.hulbert@bti.ac.nz

07 562 2926

Bethlehem Tertiary Institute

24 Elder Lane

Bethlehem, Tauranga, 3110

Project Supervisor

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Auckland University of Technology

School of Education, North Campus

Approved by the Auckland University of Technology Ethics Committee on 28/09/21, AUTEC Reference 21/329.

Appendix B: Permission to Conduct Research

Permission for researchers to access organisation school staff / students.

Project title: ***Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research***

Project Supervisor: ***Associate Professor Leon Benade***

Researcher: ***Rachelle Hulbert***

- ○ I have read and understood the information provided about this research project in the Information Sheet dated XXX.
- ○ I give permission for the researcher to undertake research within _____
- ○ I give permission for the researcher to access the staff / employees of _____

Principal's signature: .....

Principal's name: .....

Principal's Contact Details:

.....

.....

.....

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on *type the date on which the final approval was granted* ***AUTEC Reference number*** *type the AUTEC reference number*

Note: The head of the organisation should retain a copy of this form.

Appendix C: Invitation to Participate in the Research

Research, Focus Groups & Interview Participant Information Sheets

Letter of Invitation to Participate in Research

Date: _____

Project Title

Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research

Invitation

Tena koe,

My name is Rachelle Hulbert, I am undertaking my Ed.D. though Auckland University of Technology. As part of my Ed.D. qualification, I would like to invite you and members of your staff to participate in a research project that explores a school's professional learning experiences in sustainability education and local curriculum design.

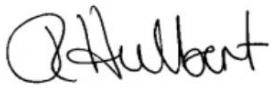
The main purpose of this research project is to understand how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design. This valuable information has the potential to deepen our collective educational understanding of the characteristics of sustainability education, of how professional learning in sustainability education can shape local curriculum design and teaching practice, and how professional learning might be arranged to further enable sustainability education practice to be developed.

The study is designed to be spread over four school terms, beginning in Term 1 2022, with PLD occurring during Term 2 and 3 2022, and concluding in Term 4 2022. As part of the study, I am offering two terms of free school PLD in sustainability education and local curriculum design. The content and structure of this PLD will be determined by data emerging from participant interviews in consultation with a school leaders' focus group. Important to note is that due to the current Covid-19 restrictions, the data collection and PLD may be completed using a variety of online digital platforms, including Zoom. For the last 9 years I have taught Year 3 pre-service teachers a course in sustainability education and during that time have researched widely the pedagogy associated with sustainability education and the resources available to teachers. With one of four Ministry of Education PLD priorities being local curriculum design, this research is well placed to feed into existing dialogue on this important learning area.

As principal of the school, I would like to invite you and your team to participate in this unique and exciting project. You are under no obligation to accept this invitation. However, if you do choose to give your consent, the information gathered from you and your team will help me to gain important answers to the following question:

How can professional learning support teachers to embed sustainability education in their teaching practice and local curriculum design?

Nga Mihi Nui



Rachelle Hulbert

Ed.D. Candidate

School of Education

Auckland University of Technology

What is the purpose of this research?

The purpose of this research is to find out how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design and how insight from this can inform schools wishing to engage in sustainability education and local curriculum design. It also engages with how professional learning can be arranged to better support sustainability education to be enmeshed with responsive local curriculum design.

The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

The school has been identified and invited to participate in this research project because you are based in the Tauranga region. To take part in the research project and PLD, there must be an agreement that teachers are able to be recruited to take part in the research project as co-producers of knowledge (separate to taking part int eh sustainability education and local curriculum design PLD). Separate participant information forms and consent forms have been created for each phase of data collection in the research project.

The research seeks to involve primary school teachers from a single case study school in New Zealand. The school must have had some involvement in sustainability education (either through an external organisation or through existing school curriculum design and teachers pursuing avenues of interest). Additionally, the school must indicate a willingness to commit to sustainability education and local curriculum design PLD during Term 2 and 3, 2022

To participate, participants must be New Zealand registered teachers (provisional, subject to confirmation or full practicing certificates are required). Any teachers who studied at and graduated from Bethlehem Tertiary Institute between 2013 – 2021 will be excluded from participating in this research project due to a conflict of interest with the researcher. Students at the school will not be involved in any aspect of the research as the project is focused on sustainability education and local curriculum design PLD for teachers.

How do I agree to participate in this research?

All participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage your school. Participants can withdraw from the study at any time. If participants choose to withdraw from the study, then they will be offered the choice between having any data that is identifiable as belonging to them removed or allowing it to continue to be used. However, once the findings have been produced, removal of data may not be possible.

Participant's choice to participate in the research project will be given by completing a consent form, which can be found at the end of the information sheet related to each data collection tool. Consent will involve submitting an email address which they can be directly contacted and providing a pseudonym by which they want to be known throughout the written work.

What will happen in this research?

School Leader's Focus Groups: In phase one of the research (PAR cycle one), participants are invited to participate in 2 x 45min – 1 hr focus group sessions to take place during Term 1, 2022. These two focus groups will be used to discuss the findings from the participant interviews and to decide the content and structure of the PLD sessions which will take place during Term 2 and Term 3, 2022. A further two focus group sessions will be held in 2022, one during the PLD at the end of Term 2 and the other at the end of the PLD and after the second round of interviews in Term 4, 2022. The purpose of this last focus group is to discuss the findings from the second round of interviews to plan a way forward for sustainability PLD for the remainder of the school year. To participate, teachers will need to give their consent on the form provided. Included on the consent form is space for teachers to provide an email address at which further information related to the research project can be sent, and a space for them to write the pseudonym they wish to be referred to in all written documentation related to this research project.

Interviews:

In phase one of the research (PAR cycle one), teachers are being invited to participate in a semi-structured interview about the characteristics of sustainability education and how you teach sustainability. The interview should take about 30 minutes to complete and will be conducted online via Zoom. To participate teachers will need to give their consent on the form provided. Included on the consent form is space for teachers to provide an email address at which further information related to the research project can be sent, and a space for them to write the pseudonym they wish to be referred to in all written documentation related to this research project.

In phase three of the research (PAR cycle three), teachers are again being invited to participate in a semi-structured interview on Zoom about their teaching experiences, focussing on the influence of professional learning and development related to sustainability education and local curriculum design. These interviews will help in understanding how professional learning can be arranged to support ongoing PLD related to sustainability education becoming enmeshed in local curriculum design. The interview should take about 30 minutes to complete.

To participate teachers will need to give their consent on the form provided. Included on the consent form is space for teachers to provide their email address at which further information related to the research project can be sent, and a space for them to write the pseudonym they wish to be referred to in all written documentation related to this research project.

Sustainability education and local curriculum design PLD:

I will provide PLD in sustainability education and local curriculum design during Term 2 and 3 of 2022. The content, structure, and frequency of this PLD will be determined by the school leaders focus groups and as a result of the data collected from the first round of participant interviews in 2022. All staff will be involved in the PLD, and no data will be directly gathered from these sessions.

Documentary Analysis Focus Group:

In phase two of the research (PAR cycle two), teachers are being invited to participate in a documentary analysis focus group about the planning and teaching of sustainability as a result of PLD in sustainability education and local curriculum design. The focus group will be conducted either via Zoom or in person at the school site and should take between 1hr 30 minutes – 2 hours to complete. To participate teachers will need to give their consent on the form provided. Included on the consent form is space for teachers to provide an email address at which further information related to the research project can be sent, and a space for them to write the pseudonym they wish to be referred to in all written documentation related to this research project.

The data gathered during the focus group sessions will:

- Influence the sustainability education PLD that will take place during Term 2 and 3, 2022.
- Influence ongoing sustainability education PLD in the school.
- Be used in the submission of a thesis towards an Ed.D. qualification at Auckland University of Technology.
- Be used in subsequent publications in research books and journals and presentations at conferences related to the topic researched.

What are the discomforts and risks?

There should be minimal potential for discomfort and risk in phase one of the research.

How will these discomforts and risks be alleviated?

During this aspect of the research, the potential discomfort and risk has been alleviated with,

- The choice to participate is that of the participant alone.
- All information provided in the research will be only accessed by the researcher and transcriptionist. All data will be stored in a password protected hard drive when the transcripts have been completed
- In line with Auckland University of Technology data storage protocol, after six years of storage all data on the external hard drives will be deleted.
- An email address will be provided, allowing you to communicate concerns at all phases of the research, including risk or discomfort. This research address will be for the primary supervisor of the research project, Associate Professor Leon Benade leon.benade@aut.ac.nz
- In the case of risk or discomfort, counselling and wellbeing support will be provided at the request of the participant.

What are the benefits?

The benefit to the participant

- The immediate benefit is that the data provided will shape the PLD related to sustainability education and local curriculum design.
- It will allow the missing voice of teachers to be heard and contribute to the design of PLD related to sustainability education and local curriculum design.
- Other PLD providers will be able to use the voice that participants provide to design PLD that are better positioned to support the emergence of autonomy, knowledge, and responsibility in line with teaching sustainability and designing local curriculum.
- Participants will see the potential that sharing their voice has within the educational discourse and be encouraged to keep reflecting on and sharing their experiences so that others can benefit.

The benefit to the researcher

- The first benefit is that this project will allow them to grow in their research capability in an educational field about which they are passionate. This will contribute directly to the growth of their academic profile both within educational philosophy and sustainability education research communities, and as a PLD provider and an educator of pre-service teachers.
- The research will develop research skills in methodologies that use sustainability education and participatory approaches in exploring how sustainability is taught and how sustainability PLD is structured and delivered.
- This research contributes towards gaining the Ed.D. qualification.
- The research will assist in the development of sustainability education PLD design within the ITE teaching and learning space at BTI.
- The literature review for this research is contributing toward the B.Ed. (Teaching) Primary degree Approval process at the tertiary provider the researcher works.

The benefit to the community

- This research will add benefit to the educational community in Aotearoa by widening the discourse on sustainability education and local curriculum design in primary school education, giving teachers a voice.
- By assisting a school to support the development of sustainability education, it is more likely that they will continue to address their community's most pressing needs in their teaching and learning programmes in line with the NZ curriculum.
- The research will add to the continued development of research methodologies that allow missing voices to be explored and contribute to the educational discourse.
- This research will add new insight to the existing body of knowledge on sustainability education and local curriculum design. It will add a focus that represents Aotearoa and our educational community.

How will privacy be protected?

All involvement this research is anonymous. Pseudonyms will be used in any written work to protect participant identity though anonymisation.

What are the costs of participating in this research?

Participation in each of the four focus groups should take between 45-minute – 1 hour of time. This will involve discussion and decision making. The four focus groups will be spread out over four school terms.

Participation in the interviews will take 30-minutes in Term 1, 2022 and 30-minutes in Term 4, 2022.

Participation in the documentary analysis focus group will take 2 hours at the end of Term 3, 2022

What opportunity do I have to consider this invitation?

10 working days will be given to consider this invitation. A reminder of this invitation will be sent out twice before it closes. This will be the same pattern used to recruit teacher participants for each phase of data collection.

Will I receive feedback on the results of this research?

At the conclusion of each phase (PAR cycle), a summary of the findings will be available to participants and discussed with the sustainability education PLD 'leadership focus group'. Findings from the interviews will steer the content, organisation, and structure of the PLD. At the conclusion of the phase three (PAR cycle three) interviews, a summary of the findings will be available again, to participants and discussed with the sustainability education PLD 'leadership focus group'. All transcripts from the focus group discussions will be made available to members of the group to check for accuracy, as will be the summary of findings from all focus group discussions.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Associate Professor Leon Benade*

leon.benade@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Lead Researcher

Rachelle Hulbert

r.hulbert@bti.ac.nz

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Co-supervisor

Dr Howard Youngs

howard.youngs@aut.ac.nz

Researcher Contact Details:

Rachelle Hulbert

r.hulbert@bti.ac.nz

07 562 2926

Bethlehem Tertiary Institute

24 Welder Lane

Bethlehem, Tauranga, 3110

Project Supervisor Contact Details:

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Auckland University of Technology

School of Education, North Campus

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted*, AUTEC Reference number *type the reference number*.

Participant Information Sheet

This participant information sheet relates to **phase one**, **phase two, and phase three** of the research project, involving a **focus group**.

Date Information Sheet Produced:

20 February 2022

Project Title

Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research

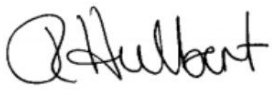
Invitation

Tena koe,

My name is Rachelle Hulbert, I am undertaking my Ed.D. though Auckland University of Technology. As part of my Ed.D. qualification, I would like to invite you to participate in a research project that explores a school's professional learning experiences in sustainability education and local curriculum design.

This invitation invites you to participate in all phases of this participatory action research (PAR cycle 1, 2, & 3), involving 4 x 45-minute – 1 hour focus group sessions spread out over four school terms. The purpose of this focus group is to analyse the characteristics of sustainability education and how it is conceptualised on your school site. As part of the focus group, we will work with the findings from participant interviews to decide on the structure and content of the sustainability education and local curriculum design PLD to be undertaken during Term 1 and Term 2, 2022. We will also meet to discuss the effectiveness of the PLD and consider how the school site conditions might be adjusted to further enable sustainability education and local curriculum design. As a result, we will collaboratively plan the next PLD steps for the school, following the two terms of PLD delivered by me. Due to the current Covid-19 restrictions, the focus group sessions are most likely to take place online via Zoom.

Nga Mihi Nui



Rachelle Hulbert

Ed.D. Candidate

School of Education

Auckland University of Technology

What is the purpose of this research?

The purpose of this research is to find out how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design and how insight from this can inform schools wishing to engage in sustainability education and local curriculum design. It also engages with how professional learning can be arranged to better support sustainability education to be enmeshed with responsive local curriculum design.

The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

You have been identified and invited to participate in this research project because you are a leader at the case study school where professional learning and development in sustainability and local curriculum design will take place during Term 2 and 3, 2022

The research seeks to involve primary school teachers from a single case study school in New Zealand. To participate, participants must be New Zealand registered teachers (provisional, subject to confirmation or full practicing certificates are required). Any teachers who studied at and graduated from Bethlehem Tertiary Institute between 2013 – 2021 will be excluded from participating in this research project due to a conflict of interest with the researcher.

How do I agree to participate in this research?

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

Your choice to participate in the research project will be given by completing the consent form, found at the end of this information sheet. This will involve you submitting an email address, whey you can be directly contacted, and providing a pseudonym by which you want to be known throughout the written work.

What will happen in this research?

In phase one of the research (PAR cycle one), you are being invited to participate in 2 x 45min – 1 hr focus group sessions to take place during Term 1, 2022. These two focus groups will be used to discuss the findings from the participant interviews and to decide the content and structure of the PLD sessions which will take place during Term 2 and Term 3, 2022. A further two focus group sessions will be held in 2022, one during the PLD at the end of Term 2 and the other at the end of the PLD and after the second round of interviews in Term 4, 2022. The purpose of this last focus group is to discuss the findings from the second round of interviews to plan a way forward for sustainability PLD for the remainder of the school year. To participate you will need to give your consent on the form provided. Included on the consent form is space for you to provide an email address at which further information related to the research project can be sent, and a space for you to write the pseudonym you wish to be referred to in all written documentation related to this research project.

The data gathered during the focus group sessions will:

- Influence the sustainability education PLD that will take place during Term 2 and 3, 2022.
- Influence ongoing sustainability education PLD in the school.
- Be used in the submission of a thesis towards an Ed.D. qualification at Auckland University of Technology.
- Be used in subsequent publications in research books and journals and presentations at conferences related to the topic researched.

What are the discomforts and risks?

There should be minimal potential for discomfort and risk in phase one of the research.

How will these discomforts and risks be alleviated?

During this aspect of the research, the potential discomfort and risk has been alleviated with,

- The choice to participate is that of you, the participant alone.
- All information provided in the research will be only accessed by the researcher and transcriptionist. All data will be stored in a password protected hard drive when the transcripts have been completed

- In line with Auckland University of Technology data storage protocol, after six years of storage all data on the external hard drives will be deleted.
- An email address will be provided, allowing you to communicate concerns at all phases of the research, including risk or discomfort. This research address will be for the primary supervisor of the research project, Associate Professor Leon Benade leon.benade@aut.ac.nz
- In the case of risk or discomfort, counselling and wellbeing support will be provided at the request of the participant.

What are the benefits?

The benefit to the participant

- The immediate benefit is that the data provided will shape the PLD related to sustainability education and local curriculum design.
- It will allow the missing voice of teachers to be heard and contribute to the design of PLD related to sustainability education and local curriculum design.
- Other PLD providers will be able to use the voice that participants provide to design PLD that are better positioned to support the emergence of autonomy, knowledge, and responsibility in line with teaching sustainability and designing local curriculum.
- Participants will see the potential that sharing their voice has within the educational discourse and be encouraged to keep reflecting on and sharing their experiences so that others can benefit.

The benefit to the researcher

- The first benefit is that this project will allow them to grow in their research capability in an educational field about which they are passionate. This will contribute directly to the growth of their academic profile both within educational philosophy and sustainability education research communities, and as a PLD provider and an educator of pre-service teachers.
- The research will develop research skills in methodologies that use sustainability education and participatory approaches in exploring how sustainability is taught and how sustainability PLD is structured and delivered.
- This research contributes towards gaining the Ed.D. qualification.
- The research will assist in the development of sustainability education PLD design within the ITE teaching and learning space at BTI.
- The literature review for this research is contributing toward the B.Ed. (Teaching) Primary degree Approval process at the tertiary provider the researcher works.

The benefit to the community

- This research will add benefit to the educational community in Aotearoa by widening the discourse on sustainability education and local curriculum design in primary school education, giving teachers a voice.
- By assisting a school to support the development of sustainability education, it is more likely that they will continue to address their community's most pressing needs in their teaching and learning programmes in line with the NZ curriculum.
- The research will add to the continued development of research methodologies that allow missing voices to be explored and contribute to the educational discourse.
- This research will add new insight to the existing body of knowledge on sustainability education and local curriculum design. It will add a focus that represents Aotearoa and our educational community.

How will my privacy be protected?

Your involvement this research is anonymous. Pseudonyms will be used in any written work to protect participant identity though anonymisation.

What are the costs of participating in this research?

Participation in each of the four focus groups should take between 45-minute– 1 hour of your time. This will involve discussion and decision making. The four focus groups will be spread out over four school terms.

What opportunity do I have to consider this invitation?

10 working days will be given to consider this invitation. A reminder of this invitation will be sent out twice before it closes.

Will I receive feedback on the results of this research?

At the conclusion of phase one (PAR cycle one), a summary of the findings will be available to participants and discussed with the sustainability education PLD 'leadership focus group'. Findings from the interviews will steer the content, organisation, and structure of the PLD. At the conclusion of the phase three (PAR cycle three) interviews, a summary of the findings will be available again, to participants and discussed with the sustainability education PLD 'leadership focus group'. All transcripts from the focus group discussions will be made available to members of the group to check for accuracy, as will be the summary of findings from all focus group discussions.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Associate Professor Leon Benade*

leon.benade@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Lead Researcher

Rachelle Hulbert

r.hulbert@bti.ac.nz

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Co-supervisor

Dr Howard Youngs

howard.youngs@aut.ac.nz

Researcher Contact Details:

Rachelle Hulbert

r.hulbert@bti.ac.nz

07 562 2926

Bethlehem Tertiary Institute

24 Welder Lane

Bethlehem, Tauranga, 3110

Project Supervisor Contact Details:

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Auckland University of Technology

School of Education, North Campus

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted*, AUTEC Reference number *type the reference number*.

Participant Information Sheet

This participant information sheet relates to **phase one** of the research project, involving **participant interviews**.

Date Information Sheet Produced:

20 February 2022

Project Title

Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research

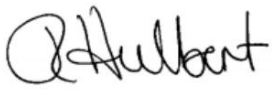
Invitation

Tena koe,

My name is Rachelle Hulbert, I am undertaking my Ed.D. though Auckland University of Technology. As part of my Ed.D. qualification, I would like to invite you to participate in a research project that explores your professional learning experiences in sustainability education and local curriculum design.

This invitation invites you to participate in phase one (PAR cycle 1) of the research, a 30-minute semi-structured interview via Zoom. The purpose of this interview is to glean insight from your teaching experiences about the characteristics of sustainability education to understand how teachers are teaching sustainability. The findings of these interviews will help shape the content and structure of sustainability education and local curriculum design PLD in Term 2 and 3 next year. This proposal also invites you to consider the option of participating in PAR cycle 2 and 3 of the research project.

Nga Mihi Nui



Rachelle Hulbert

Ed.D. Candidate

School of Education

Auckland University of Technology

What is the purpose of this research?

The purpose of this research is to find out how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design and how insight from this can inform schools wishing to engage in sustainability education and local curriculum design. It also engages with how professional learning can be arranged to better support sustainability education to be enmeshed with responsive local curriculum design.

The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

You have been identified and invited to participate in this research project because you are a teacher at the case study school where professional learning and development in sustainability and local curriculum design will take place during the Term 2 and 3, 2022.

The research seeks to involve primary school teachers from a single case study school in New Zealand. To participate, participants must be New Zealand registered teachers (provisional, subject to confirmation or full practicing certificates are required). Any teachers who studied at and graduated from Bethlehem Tertiary Institute between 2013 – 2021 will be excluded from participating in this research project due to a conflict of interest with the researcher.

How do I agree to participate in this research?

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

Your choice to participate in phase one of the research project will be given by completing the Phase 1 (PAR cycle one) consent form, found at the end of this information sheet. This will involve you submitting an email address, whey you can be directly contacted, and providing a pseudonym by which you want to be known throughout the written work. Further information and consent forms for the remaining two phases of the research will be sent to you via the email address you provide.

What will happen in this research?

In phase one of the research (PAR cycle one), you are being invited to participate in a semi-structured interview about the characteristics of sustainability education and how you teach sustainability. The interview should take about 30 minutes to complete. To participate you will need to give your consent on the form provided. Included on the consent form is space for you to provide an email address at which further information related to the research project can be sent, and a space for you to write the pseudonym you wish to be referred to in all written documentation related to this research project.

The data gathered in this phase of the research will:

- Influence the sustainability education PLD that will take place during Term 2 and 3, 2022.
- Be used in the submission of a thesis towards an Ed.D. qualification at Auckland University of Technology.
- Be used in subsequent publications in research books and journals and presentations at conferences related to the topic researched.

What are the discomforts and risks?

There should be minimal potential for discomfort and risk in phase one of the research.

How will these discomforts and risks be alleviated?

During phase one of the research, the potential discomfort and risk has been alleviated with,

- The choice to participate is that of you, the participant alone.
- All information provided in the research will be only accessed by the researcher and transcriptionist. All data will be stored in a password protected hard drive when the transcripts have been completed
- In line with Auckland University of Technology data storage protocol, after six years of storage all data on the external hard drives will be deleted.

- An email address will be provided, allowing you to communicate concerns at all phases of the research, including risk or discomfort. This research address will be for the primary supervisor of the research project, Associate Professor Leon Benade leon.benade@aut.ac.nz
- In the case of risk or discomfort, counselling and wellbeing support will be provided at the request of the participant.

What are the benefits?

The benefit to the participant

- The immediate benefit is that the data provided will shape the PLD related to sustainability education and local curriculum design.
- It will allow the missing voice of teachers to be heard and contribute to the design of PLD related to sustainability education and local curriculum design.
- Other PLD providers will be able to use the voice that participants provide to design PLD that are better positioned to support the emergence of autonomy, knowledge, and responsibility in line with teaching sustainability and designing local curriculum.
- Participants will see the potential that sharing their voice has within the educational discourse and be encouraged to keep reflecting on and sharing their experiences so that others can benefit.

The benefit to the researcher

- The first benefit is that this project will allow them to grow in their research capability in an educational field about which they are passionate. This will contribute directly to the growth of their academic profile both within educational philosophy and sustainability education research communities, and as a PLD provider and an educator of pre-service teachers.
- The research will develop research skills in methodologies that use sustainability education and participatory approaches in exploring how sustainability is taught and how sustainability PLD is structured and delivered.
- This research contributes towards gaining the Ed.D. qualification.
- The research will assist in the development of sustainability education PLD design within the ITE teaching and learning space at BTI.
- The literature review for this research is contributing toward the B.Ed. (Teaching) Primary degree Approval process at the tertiary provider the researcher works.

The benefit to the community

- This research will add benefit to the educational community in Aotearoa by widening the discourse on sustainability education and local curriculum design in primary school education, giving teachers a voice.
- By assisting a school to support the development of sustainability education, it is more likely that they will continue to address their community's most pressing needs in their teaching and learning programmes in line with the NZ curriculum.
- The research will add to the continued development of research methodologies that allow missing voices to be explored and contribute to the educational discourse.
- This research will add new insight to the existing body of knowledge on sustainability education and local curriculum design. It will add a focus that represents Aotearoa and our educational community.

How will my privacy be protected?

Your involvement in phase one of this research is anonymous. Pseudonyms will be used in any written work to protect participant identity though anonymisation.

What are the costs of participating in this research?

Participation in phase one of the research should take between 30-40 minutes of your time. This will involve a semi-structured interview.

What opportunity do I have to consider this invitation?

10 working days will be given to consider this invitation. A reminder of this invitation will be sent out twice before it closes.

Will I receive feedback on the results of this research?

At the conclusion of phase one (PAR cycle one), a summary of the findings will be available to participants and discussed with the sustainability education PLD 'leadership focus group'. Findings from the interviews will steer the content, organisation, and structure of the PLD.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Associate Professor Leon Benade*

leon.benade@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Lead Researcher

Rachelle Hulbert

r.hulbert@bti.ac.nz

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Co-supervisor

Dr Howard Youngs

howard.youngs@aut.ac.nz

Researcher Contact Details:

Rachelle Hulbert

r.hulbert@bti.ac.nz

07 562 2926

Bethlehem Tertiary Institute

24 Welder Lane

Bethlehem, Tauranga, 3110

Project Supervisor Contact Details:

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Auckland University of Technology

School of Education, North Campus

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted*, AUTEC Reference number *type the reference number*.

Participant Information Sheet
Phase Two: Teacher Participant Interview

Date Information Sheet Produced:

8 December 2022

Project Title

Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research

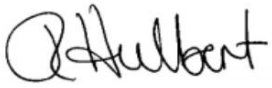
Invitation

Tena koe,

As you are aware, I am undertaking my Ed.D. though Auckland University of Technology. As part of my Ed.D. qualification, I would like to invite you to participate in the next phase of my research project which explores your professional learning experiences in sustainability education and local curriculum design.

This invitation invites you to participate in phase two (PAR cycle 2) of the research, a 30-minute semi-structured interview. The purpose of this interview is to glean insight from your PLD experiences in sustainability education and local curriculum design, and to evaluate the PLD in order to understand how changes in practice arrangements might further enable sustainability education and local curriculum design. The findings of these interviews will help shape the content and structure of ongoing PLD related sustainability education and local curriculum.

Nga Mihi Nui



Rachelle Hulbert

Ed.D. Candidate

School of Education

Auckland University of Technology

What is the purpose of this research?

The purpose of this research is to find out how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design and how insight from this can inform schools wishing to engage in sustainability education and local curriculum design. It also engages with how professional learning can be arranged to better support sustainability education to be enmeshed with responsive local curriculum design.

The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

You have been identified and invited to participate in this research project because you are a teacher at the case study school where professional learning and development in sustainability and local curriculum design will take place during the first two school terms of 2022.

The research seeks to involve teachers from a single case study school in the Tauranga region. In order to participate, participants must be New Zealand registered teachers (provisional, subject to confirmation or full practicing certificates are required). Any teachers who studied at and graduated from Bethlehem Tertiary Institute between 2013 – 2021 will be excluded from participating in this research project due to a conflict of interest with the researcher.

How do I agree to participate in this research?

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

Your choice to participate in phase one of the research project will be given by completing the Phase 2 (PAR cycle one) consent form, found at the end of this information sheet. This will involve you submitting an email address, whey you can be directly contacted, and providing a pseudonym by which you want to be known throughout the written work. Further information and consent forms for the remaining two phases of the research will be sent to you via the email address you provide.

What will happen in this research?

In phase two of the research (PAR cycle two), you are being invited to participate in a semi-structured interview to evaluate the sustainability PLD and understand how changes in the practice arrangements of the school might further enable sustainability education and local curriculum design. The interview should take about 30 minutes to complete. To participate you will need to give your consent on the form provided. Included on the consent form is space for you to provide an email address at which further information related to the research project can be sent, and a space for you to write the pseudonym you wish to be referred to in all written documentation related to this research project.

The data gathered in this phase of the research will:

- Influence any further sustainability education PLD that will take place in the school.
- Be used towards the development of an Ed.D thesis qualification at Auckland University of Technology.
- Be used in subsequent publications in research books and journals and presentations at conferences related to the topic researched.

What are the discomforts and risks?

There should be minimal potential for discomfort and risk in phase one of the research.

How will these discomforts and risks be alleviated?

During phase one of the research, the potential discomfort and risk has been alleviated with,

- The choice to participate is that of you, the participant alone.

- All information provided in the research will be only accessed by the researcher and transcriptionist. All data will be stored in a password protected hard drive when the transcripts have been completed
- In line with Auckland University of Technology data storage protocol, after six years of storage all data on the external hard drives will be deleted. However, any anonymised data such as transcripts may be kept as long as needed to write up research for further publications.
- An email address will be provided, allowing you to communicate concerns at all phases of the research, including risk or discomfort. This research address will be for the primary supervisor of the research project, Associate Professor Leon Benade leon.benade@aut.ac.nz
- In the case of risk or discomfort, counselling and wellbeing support will be provided. AUT Student Counselling and Mental Health offers three free sessions of confidential counselling support for adult participants in an AUT research project. These sessions are only available for issues that have arisen directly because of participation in the research and are not for other general counselling needs. To access these services, you will need to:
  - drop into our centre at WB203 City Campus, email counselling@aut.ac.nz or call 921 9998.
  - let the receptionist know that you are a research participant and provide the title of my research and my name and contact details as given in this Information Sheet.
  - You can find out more information about AUT counsellors and counselling on https://www.aut.ac.nz/student-life/student-support/counselling-and-mental-health

What are the benefits?

The benefit to the participant

- The immediate benefit is that the data provided will shape the PLD related to sustainability education and local curriculum design.
- It will allow the missing voice of teachers to be heard and contribute to the design of PLD related to sustainability education and local curriculum design.
- Other PLD providers, if they access the thesis through the AUT Library, may choose to use the voice that participants provided to design PLD that positions them to support the emergence of autonomy, knowledge and responsibility in line with teaching sustainability, and designing local curriculum.
- Participants will see the potential that sharing their voice has within the educational discourse and be encouraged to keep reflecting on and sharing their experiences so that others can benefit.

The benefit to the researcher

- The first benefit is research capability development in a relevant educational field, contributing directly to the growth of my academic profile both within educational philosophy and sustainability education research communities, and as a PLD provider and an educator of pre-service teachers.
- The research will develop my research skills in methodologies that use sustainability education and participatory approaches in exploring how sustainability is taught and how sustainability PLD is structured and delivered.
- This research contributes towards gaining the Ed.D. qualification.

The benefit to the community

- This research will add benefit to the educational community in Aotearoa by widening the discourse on sustainability education and local curriculum design in primary school education, giving teachers a voice.
- By assisting a school to support better the development of sustainability education, it is more likely that they will continue to address their community's most pressing needs in their teaching and learning programmes in line with the NZ curriculum.
- The research will add to the continued development of research methodologies that allow missing voices to be explored and contribute to the educational discourse.

- This research will add new insight to the existing body of knowledge on sustainability education and local curriculum design. It will add a focus that represents Aotearoa and our educational community.

How will my privacy be protected?

Your involvement in phase one of this research is confidential. Pseudonyms will be used in any written work to protect participant identity though anonymisation.

What are the costs of participating in this research?

Participation in phase one of the research should take between 30-40 minutes of your time. This will involve a semi-structured interview.

What opportunity do I have to consider this invitation?

10 working days will be given to consider this invitation. A reminder of this invitation will be sent out before it closes.

Will I receive feedback on the results of this research?

At the conclusion of phase two (PAR cycle two), a summary of the findings will be available to participants and discussed with the sustainability education PLD 'leadership focus group'. Findings from the interviews will steer the content, organisation and structure of further PLD.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Associate Professor Leon Benade*

leon.benade@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Student Researcher

Rachelle Hulbert

r.hulbert@bti.ac.nz

07 562 2926

Bethlehem Tertiary Institute

24 Elder Lane

Bethlehem, Tauranga, 3110

Project Supervisor

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Auckland University of Technology

School of Education, North Campus

Approved by the Auckland University of Technology Ethics Committee on 29/11/22, AUTEC Reference 21/329.

Participant Information Sheet: Phase Three: Document Focus Group

Date Information Sheet Produced:

27 March 2023

Project Title

Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research

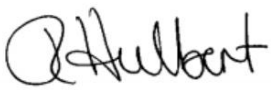
Invitation

Tena koe,

My name is Rachelle Hulbert, I am undertaking my Ed.D. though Auckland University of Technology. As part of my Ed.D. qualification, I would like to invite you to participate in a research project that explores a school's professional learning experiences in sustainability education and local curriculum design.

This invitation invites you to participate in phase three of this participatory action research (PAR cycle 3), involving 1 x 1hr 30min focus group session at the end of Term One. The purpose of this focus group is to interpret from multiple perspectives, understandings of situations where PLD informs school curriculum and classroom practice. As part of the focus group, we will look at and discuss your planning from Term One. As a result, we will consider next PLD steps for the school following the two terms of PLD delivered by me, and how planning might be adjusted to incorporate a sustainability focus in local curriculum design when working with the New Zealand Curriculum.

Nga Mihi Nui



Rachelle Hulbert

Ed.D. Candidate

School of Education

Auckland University of Technology

What is the purpose of this research?

The purpose of this research is to find out how professional learning can support teachers to embed sustainability education in their teaching practice and local curriculum design and how insight from this can inform schools wishing to engage in sustainability education and local curriculum design. It also engages with how professional learning can be arranged to better support sustainability education to be enmeshed with responsive local curriculum design.

The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

You have been identified and invited to participate in this research project because you are a leader or a teacher at the case study school where professional learning and development in sustainability and local curriculum design took place during Term 3 and Term 4 in 2022.

The research seeks to involve teachers from a single case study school. In order to participate, participants must be New Zealand registered teachers (provisional, subject to confirmation or full practicing certificates are required). Any teachers who studied at and graduated from Bethlehem Tertiary Institute between 2013 – 2021 will be excluded from participating in this research project due to a conflict of interest with the researcher.

How do I agree to participate in this research?

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

Your choice to participate in the research project will be given by completing the consent form, found at the end of this information sheet. This will involve you submitting an email address, whey you can be directly contacted, and providing a pseudonym by which you want to be known throughout the written work.

What will happen in this research?

In phase three of the research (PAR cycle three), you are being invited to participate in 1 x 1 hr 30 min focus group to take place towards the end of Term 1, 2023. This focus group will be used to discuss teacher planning to understand how sustainability education PLD shapes local curriculum design and teaching practice.

To participate you will need to give your consent on the form provided. Included on the consent form is space for you to provide an email address at which further information related to the research project can be sent, and a space for you to write the pseudonym you wish to be referred to in all written documentation related to this research project.

The data gathered during the focus group session will:

- Influence what sustainability education and local curriculum design planning might look like going forward.
- Be used in the development of an Ed.D thesis towards a qualification at Auckland University of Technology.
- Be used in subsequent publications in research books and journals and presentations at conferences related to the topic researched.

What are the discomforts and risks?

There should be minimal potential for discomfort and risk in phase one of the research.

How will these discomforts and risks be alleviated?

- The choice to participate is that of you, the participant alone.

- All information provided in the research will be only accessed by the researcher and transcriptionist. All data will be stored in a password protected hard drive when the transcripts have been completed
- In line with Auckland University of Technology data storage protocol, after six years of storage all data on the external hard drives will be deleted. However, any anonymised data such as transcripts may be kept as long as needed to write up research for further publications.
- An email address will be provided, allowing you to communicate concerns at all phases of the research, including risk or discomfort. This research address will be for the primary supervisor of the research project, Associate Professor Leon Benade leon.benade@aut.ac.nz
- In the case of risk or discomfort, counselling and wellbeing support will be provided. AUT Student Counselling and Mental Health offers three free sessions of confidential counselling support for adult participants in an AUT research project. These sessions are only available for issues that have arisen directly because of participation in the research and are not for other general counselling needs. To access these services, you will need to:
  - drop into our centre at WB203 City Campus, email counselling@aut.ac.nz or call 921 9998.
  - let the receptionist know that you are a research participant and provide the title of my research and my name and contact details as given in this Information Sheet.
  - You can find out more information about AUT counsellors and counselling on https://www.aut.ac.nz/student-life/student-support/counselling-and-mental-health

What are the benefits?

The benefit to the participant

- The immediate benefit is that the data provided will shape the PLD related to sustainability education and local curriculum design.
- It will allow the missing voice of teachers to be heard and contribute to the design of PLD related to sustainability education and local curriculum design.
- Other PLD providers will be able to use the voice that participants provide to design PLD that are better positioned to support the emergence of autonomy, knowledge, and responsibility in line with teaching sustainability and designing local curriculum.
- Participants will see the potential that sharing their voice has within the educational discourse and be encouraged to keep reflecting on and sharing their experiences so that others can benefit.

The benefit to the researcher

- The first benefit is research capability development in a relevant educational field, contributing directly to the growth of my academic profile both within educational philosophy and sustainability education research communities, and as a PLD provider and an educator of pre-service teachers.
- The research will develop my research skills in methodologies that use sustainability education and participatory approaches in exploring how sustainability is taught and how sustainability PLD is structured and delivered.
- This research contributes towards gaining the Ed.D. qualification.

The benefit to the community

- This research will add benefit to the educational community in Aotearoa by widening the discourse on sustainability education and local curriculum design in primary school education, giving teachers a voice.
- By assisting a school to support the development of sustainability education, it is more likely that they will continue to address their community's most pressing needs in their teaching and learning programmes in line with the New Zealand curriculum.
- The research will add to the continued development of research methodologies that allow missing voices to be explored and contribute to the educational discourse.

- This research will add new insight to the existing body of knowledge on sustainability education and local curriculum design. It will add a focus that represents Aotearoa and our educational community.

How will my privacy be protected?

Your involvement this research is confidential. Pseudonyms will be used in any written work to protect participant identity though anonymisation.

What are the costs of participating in this research?

Participation in the focus group session will take 1 hour 30 minutes of your time. This will involve discussion and decision making.

What opportunity do I have to consider this invitation?

Ten working days will be given to consider this invitation. A reminder of this invitation will be sent out before it closes.

Will I receive feedback on the results of this research?

A summary of the findings will be available to participants and discussed with the sustainability education PLD 'leadership focus group'. All transcripts from the focus group discussions will be made available to members of the group to check for accuracy, as will be the summary of findings from all focus group discussions.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Associate Professor Leon Benade*

leon.benade@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Student Researcher

Rachelle Hulbert

r.hulbert@bti.ac.nz

07 562 2926

Bethlehem Tertiary Institute

24 Welder Lane

Bethlehem, Tauranga, 3110

Project Supervisor

Associate Professor Leon Benade

leon.benade@aut.ac.nz

Auckland University of Technology

School of Education, North Campus

Approved by the Auckland University of Technology Ethics Committee on 28/09/21, AUTEC Reference 21/329.

Appendix D: Participant Consent Forms: Focus Groups & Interviews

Focus Group Consent Form

Project title: ***Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research***

Project Supervisor: ***Associate Professor Leon Benade***

Researcher: ***Rachelle Hulbert***

- ○ I have read and understood the information provided about this research project in the Information Sheet dated dd mmmm yyyy.
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that identity of my fellow participants and our discussions in the focus group is confidential to the group and I agree to keep this information confidential.
- ○ I understand that notes will be taken during the focus group and that it will also be recorded and transcribed.
- ○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ○ I understand that if I withdraw from the study then, while it may not be possible to destroy all records of the focus group discussion of which I was part, I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ○ I agree to take part in this research.
- ○ I wish to receive a summary of the research findings (please tick one): Yes○ No○

Participant's signature: .....

Participant's name: .....

Participant's contact email address: .....

Participant's pseudonym: .....

Date:

Approved by the Auckland University of Technology Ethics Committee on *type the date on which the final approval was granted* ***AUTEC Reference number*** *type the AUTEC reference number*

Note: The Participant should retain a copy of this form.

Interview Consent Form

Project title: ***Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research***

Project Supervisor: ***Associate Professor Leon Benade***

Researcher: ***Rachelle Hulbert***

- ○ I have read and understood the information provided about this research project in the Information Sheet dated dd mmmm yyyy.
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that they will also be recorded and transcribed.
- ○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ○ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ○ I agree to take part in this research.
- ○ I wish to receive a summary of the research findings (please tick one): Yes○ No○

Participant's signature: .....

Participant's name: .....

Participant's contact email address: .....

Participant's pseudonym: .....

Date:

Approved by the Auckland University of Technology Ethics Committee on *type the date on which the final approval was granted* ***AUTEC Reference number*** *type the AUTEC reference number*

Note: The Participant should retain a copy of this form.

Appendix E: Transcriber Confidentiality Agreement

Transcribing Data Confidentiality Agreement

Project title:	***Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research***
Project Supervisor:	***Associate Professor Leon Benade***
Researcher:	***Rachelle Hulbert***

- ○ I understand that all the material I will be asked to transcribe is confidential.
- ○ I understand that the contents of the tapes or recordings can only be discussed with the researchers.
- ○ I will not keep any copies of the transcripts nor allow third parties access to them.

Transcriber's signature: .....

Transcriber's name: .....

Transcriber's Contact Details (if appropriate):

.....

.....

.....

.....

Date:

Project Supervisor's Contact Details (if appropriate):

.....

.....

.....

.....

Approved by the Auckland University of Technology Ethics Committee on *type the date on which the final approval was granted* ***AUTEC Reference number*** *type the AUTEC reference number*

Note: The Transcriber should retain a copy of this form.

Appendix F: CPAR Phase One Semi Structured Interview Questions

CPAR Phase 1 - Cycle 1

Research Aim 1: To critically analyse characteristics of sustainability and how sustainability education is conceptualised in the school site.

Research Question 1: What characteristics of sustainability education are evident in the case study school?

Interview One Questions: Term 2 2022

1. Can you tell me about your understanding of:
    a. sustainability
    b. sustainability education

2. What issues or topics have you taught in relation to sustainability education?

3. How do you see sustainability education linked to local curriculum design?

4. How do you find information related to the content and pedagogy of what you teach in relation to sustainability education and local curriculum design?
    a. How do you plan?
    b. What sorts of resources do you use? (Online, people, organizations)

5. Can you describe some successful teaching and learning approaches related to sustainability education?
    a. Your own
    b. Approaches you have seen

6. Looking forward to our PLD sessions related to sustainability education, what aspects of sustainability education would you like us to explore?
    a. What are the local issues?
    b. What are some learning priorities for your context?

7. In what ways do you think you could be better supported to passionately engage with sustainability education and local curriculum design?

8. Is there anything else that you would like to share in relation to teaching and learning related to sustainability education?

Appendix G: Focus Group One Questions

CPAR Phase 1 - Cycle 2:

Research Aim 1: To critically analyse characteristics of sustainability and how sustainability education is conceptualised in the school site.

Research Question 1: What characteristics of sustainability education are evident in the case study school?

This focus group comes after the participant interviews and is designed to gain an **understanding of PLD structure** within the school to assist in planning PLD related to sustainability education and local curriculum design.

Focus Group (One): Term 2 2022

1. How have you been involved in PLD at this school?

2. Think back over all the years that you have participated in PLD and the topics that (name of school) PLD was focused on and tell us what has made for a successful PLD.
   a. What went well? What was useful?
   b. What needs improvement?
   c. What was the impact on the school?
   d. Did teachers
   e. effectively apply the new knowledge and skills?
   f. What was the impact on students and their learning?

3. Take a piece of paper and jot down three things that are important to you when you engage in PLD.
   a. Let us list these on the flip chart. If you had to pick only one factor that was most important to you, what would it be? You can pick something that you mentioned or something that was said by others.
   b. Of all the things we have talked about, what is most important to you?

4. Specifically looking at the practice architectures related to PLD, what has been evident in the school's sayings, doings, and relatings...
   a. … in the language and *cultural-discursive arrangements* teachers used to describe their experiences? Which hang together with...
   b. … the *material-economic arrangements* that afforded the professional learning activities? and with...
   c. … the *social-political arrangements* demonstrated in the ways teachers related to one another in their everyday realities?

5. How can we arrange PLD in sustainability education and local curriculum design so that teaching practices are intentionally secured in the sayings, doings and relatings of the teachers?
   a. What should be included in the PLD?
   b. How should the PLD be organized and structured?
   c. What can each one of us do to support teachers in their engagement with sustainability education and local curriculum design PLD?

6. Is there anything else that you would like to share in relation to the upcoming PLD related to sustainability education?

Focus Group Two Questions

CPAR Phase 1 - Cycle 3

Research Aim 1: To critically analyse characteristics of sustainability and how sustainability education is conceptualised in the school site.

Research Question 1: What characteristics of sustainability education are evident in the case study school?

This focus group comes after the participant interviews and is designed to **discuss the data** generated from the interviews and to **plan PLD** related to sustainability education and local curriculum design. Teacher participants in this group will be provided with a summary of the data to read prior to this focus group.

Focus Group (Two): Term 2 2022

1. Tell me about something positive from the sustainability, sustainability education, and local curriculum design interview summary? (Refer to document 1)
    a. What stands out? Why?
    b. What are the gaps/ areas to develop?
    c. What would be the priority for PLD?
        … in terms of content
        … in terms of pedagogy
        … in terms of structure/ time

2. Tell me about something positive from PLD focus group summary? (Refer to document 2)
    a. What stands out?
    b. Why does it stand out to you, for your context?

3. What stood out to you from *all* the information you have read?

4. What needs improvement or could be further developed?

5. How can we set up PLD in sustainability education and local curriculum design so that it meets teachers' PLD needs?
    a. What should be included in the PLD?
    b. How should the PLD be organized and structured?
    c. What can each one of us do to support each other in our engagement with sustainability education and local curriculum design PLD?
    d. What impact do we want the PLD to have on teachers' and students' learning?
    e. What can we do to ensure the PLD impacts both teachers' and students' learning?

Focus Group Three Questions

CPAR Phase 2 - Cycle 1

Research Aim 2: To interpret, from multiple perspectives, understandings of situations where PLD informs school curriculum and classroom practice.

Research Question 2: How does sustainability education professional learning shape local curriculum design and teaching practice?

This focus group comes during the PLD cycle. In this focus group, teacher participants will discuss new thinking around sustainability and local curriculum design content and pedagogy, and the progress they have made with their sustainability planning, including strengths, limitations, next steps, etc.

Focus Group 3: Term 4, 2022

1. Tell me about something positive about your sustainability planning, resultant teaching, students' learning and students' feedback?

2. Tell me about some of the limitations you encountered when planning for sustainability?

3. Tell me about something positive you have taken away from the sustainability PLD and put into practice?

4. What has stood out to you from the PLD so far?

5. What needs improvement or could be adjusted?

6. Specifically looking at the practice architectures related to PLD, what has been evident in your sayings, doings, and relatings...
    a. … in the language and *cultural-discursive arrangements* teachers used to describe their experiences? Which hang together with...
    b. … the *material-economic arrangements* that afforded the professional learning activities? and with...
    c. … the *social-political arrangements* demonstrated in the ways teachers related to one another in their everyday realities?

7. How can the school continue to arrange PLD in sustainability education and local curriculum design so that teaching practices are intentionally secured in the sayings, doings and relatings that form the practice landscape and practice traditions of the school?
    a. What should be included in the PLD?
    b. How should the PLD be organized and structured?
    c. What can each one of us do to support ongoing development of sustainability education and local curriculum design within the school?

8. Is there anything else that you would like to share in relation to the PLD related to sustainability education?

Focus Group Four Questions

CPAR Phase 2 - Cycle 2

Research Aim 2: To interpret, from multiple perspectives, understandings of situations where PLD informs school curriculum and classroom practice.

Research Question 2: How does sustainability education professional learning shape local curriculum design and teaching practice?

This focus group comes during the PLD cycle. In this focus group, teacher participants will discuss new thinking around sustainability and local curriculum design content and pedagogy, and the progress they have made with their sustainability planning, including strengths, limitations, next steps, etc.

Focus Group 4: Term 4, 2022

1. Tell me about something positive about your sustainability planning, resultant teaching, students' learning and students' feedback?
2. Tell me about some of the limitations you encountered when planning for sustainability?

3. Tell me about something positive you have taken away from the sustainability PLD and put into practice?

4. What has stood out to you from the PLD so far?

5. What needs improvement or could be adjusted?

6. Specifically looking at the practice architectures related to PLD, what has been evident in your sayings, doings, and relatings...
    a. … in the language and *cultural-discursive arrangements* teachers used to describe their experiences? Which hang together with...
    b. … the *material-economic arrangements* that afforded the professional learning activities? and with...
    c. … the *social-political arrangements* demonstrated in the ways teachers related to one another in their everyday realities?

7. How can the school continue to arrange PLD in sustainability education and local curriculum design so that teaching practices are intentionally secured in the sayings, doings and relatings that form the practice landscape and practice traditions of the school?
    a. What should be included in the PLD?
    b. How should the PLD be organized and structured?
    c. What can each one of us do to support ongoing development of sustainability education and local curriculum design within the school?

8. Is there anything else that you would like to share in relation to the PLD related to sustainability education?

Focus Group Five Questions

CPAR Phase 3 - Cycle 1

Research Aim 3: To interpret, from multiple perspectives, understandings of situations where PLD informs school curriculum and classroom practice.

Research Question 3: How does sustainability education professional learning shape local curriculum design and teaching practice?

In this focus group, teacher participants will discuss the progress they have made with their sustainability planning, including strengths, limitations, next steps, etc. Teacher participants will be asked to bring their sustainability planning to the focus group so they can use it as a prompt.

Implementation: Planning and Teaching Focus Group: Term 1, 2024

1. Tell me about something positive about your sustainability planning, resultant teaching, students' learning and students' feedback?

2. Tell me about some of the limitations you encountered when planning for sustainability?

3. Tell me about something positive you have taken away from the sustainability PLD and put into practice?

4. What stood out to you from the PLD?

5. What needs improvement?

6. Specifically looking at the practice architectures related to PLD, what has been evident in your sayings, doings, and relatings...
7. … in the language and *cultural-discursive arrangements* teachers used to describe their experiences? Which hang together with...
8. … the *material-economic arrangements* that afforded the professional learning activities? and with...
9. … the *social-political arrangements* demonstrated in the ways teachers related to one another in their everyday realities?

10. How can the school continue to arrange PLD in sustainability education and local curriculum design so that teaching practices are intentionally secured in the sayings, doings and relatings that form the practice landscape and practice traditions of the school?
11. What should be included in the PLD?
12. How should the PLD be organized and structured?
13. What can each one of us do to support ongoing development of sustainability education and local curriculum design within the school?

14. Is there anything else that you would like to share in relation to the PLD related to sustainability education?

Appendix H: Ethical Approval

Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

28 September 2021

Leon Benade
Faculty of Culture and Society

Dear Leon

Re Ethics Application: **21/329 Professional learning in sustainability education and local curriculum design: One school's practice development through participatory action research**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application is approved for three years until 28 September 2024.

Non-Standard Conditions of Approval

1. In the Information Sheet and Consent Form insert the statement "any anonymised data such as transcripts may be kept as long as needed to write up research for further publications.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through http://www.aut.ac.nz/research/researchethics

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: r.hulbert@bti.ac.nz; howard.youngs@aut.ac.nz

Appendix I: SELCD PLD Session Outlines

Sustainability and Local Curriculum Design

PLD 1 - Hā Hauora Tangata: Reconnecting with other, nature, and place

Here is an outline of what we will be doing during our first PLD session.

In this session we will:

- **Gain** a shared understanding of sustainability, sustainability education and local curriculum.
- **Identify** sustainability issues.
- **Use** our understanding of sustainability to **identify** the challenges and concerns of Pukeiāhua Pā.

Topic		Allocated time
1.	Introduction to the format of the PLD session Google Slides Link	2 minutes
2.	Explanation of the choice of title for PLD	3 minutes
3.	Define sustainability and sustainability education (Explanation & Discussion)	15 minutes
4.	Three-minute pause (Reflection opportunity)	5 minutes
5.	What are the issues? (Activity)	15 minutes
6.	Sustainability and local curriculum (Video)	20 minutes
7.	Our local area: Pukeiāhua Pā (Activity) Padlet Link	20 minutes
8.	Whakataukī	5 minutes
9.	Three-minute pause (Reflection opportunity)	5 minutes

** NB: Please bring a device to work on, e.g. laptop or iPad as well as pen and paper for recording your reflections.

Sustainability and Local Curriculum Design

PLD 2 - Hā Hauora Tangata: Reconnecting with other, nature, and place

Here is an outline of what we will be doing during our PLD session.

In this session we will:

- **Gain** a shared understanding of our shared values and how these impact our teaching.
- **Identify** environmental challenges in the local area.
- **Use** our understanding of the Heart, Head, Hands model to identify learning and teaching opportunities that reconnect with nature.

Topic		Allocated time
1.	Introduction to the format of the PLD session Google Slides Link	5 minutes
2.	Identifying our values and why this is important (Activity)	20 minutes
3.	Explore local environmental challenges (Activity)	15 minutes
4.	What is our local curriculum?	5 minutes
5.	Explain EfS concepts	5 minutes
6.	Contributing Theories to EfS	5 minutes
7.	Head, Heart, & Hands learning (Activity)	15 minutes
8.	Sustainable Development Goals (Activity)	15 minutes
9.	Instagram Your Learning (Reflection opportunity)	5 minutes

** NB: Please bring a device to work on, e.g. laptop or iPad as well as pen and paper for recording your reflections.

Sustainability and Local Curriculum Design

PLD 3 - Hā Hauora Tangata: Reconnecting with other, nature, and place

Here is an outline of what we will be doing during our PLD session.

In this session we will:

- **Gain** a shared understanding of the types of action and associated attitudes related to action competence in EfS.
- **Identify** community challenges in the local area.
- **Use** our understanding of action competence to create an action plan for a local issue.
- **Identify** how children's picture books can support EfS learning.

Topic		Allocated time
1.	Introduction to the format of the PLD session Google Slides Link	2 minutes
2.	Linking our values to EfS concepts and local curriculum	5 minutes
3.	Build our understanding of action competence and citizenship	5 minutes
4.	Reflective questions to develop informed solutions (Activity)	10 minutes
5.	Types of action (Activity)	10 minutes
6.	Four kinds of attitudes (Activity)	10 minutes
7.	What are the local community issues? Link to SDGs and Ngāruawāhia Community Board	5 minutes
8.	Create an action plan (Activity)	15 minutes
9.	Ngāruawāhia Community House	5 minutes
10.	Children's picture books to support EfS learning (Activity)	15 minutes
11.	Whakatauki	3 minutes
12.	PLD reflection & evaluation	5 minutes

** NB: Please bring a device to work on, e.g. laptop or iPad as well as pen and paper for recording your reflections. Can you also bring the SDG booklets I gave you last week as we will be using those during this session.

Sustainability and Local Curriculum Design

PLD 4 - Hā Hauora Tangata: Reconnecting with other, nature, and place

Here is an outline of what we will be doing during our PLD session.

In this session we will:

- **Gain** a shared understanding of points of entry when planning inquiry learning.
- **Use** our understanding of the Heart, Head, Hands model to identify learning and teaching opportunities that reconnect with nature.

Topic		Allocated time
1.	Introduction to the format of the PLD session Google Slides Link	5 minutes
2.	Which native tree are you like (Activity)	5 minutes
3.	Identify NZ native trees (Activity) Download free App - NZ Trees	10 minutes
4.	Rongoā Māori (Activity)	10 minutes
5.	Planning with Heart, Head, Hands (Example)	5 minutes
6.	Investigating entry points to inquiry learning. Understanding concepts linked to sustainability and inquiry	10 minutes
7.	Investigating Pūtātara and planning with Heart, Head, and Hands: Using resources	45 minutes

** NB: Please bring a device to work on, e.g. laptop or iPad as well as pen and paper for recording your reflections.

Sustainability and Local Curriculum Design

PLD 5 - Hā Hauora Tangata: Reconnecting with other, nature, and place

Here is an outline of what we will be doing during our PLD session.

In this session we will:

- **Gain** a **shared understanding** of systems thinking as an approach to teaching sustainability.
- **Understand** that national and global issues can also be local issues and that we have the opportunity to make a difference.
- **Use** our understanding of SDG 12, *Responsible Consumption and Production*; to identify ways we can encourage our students to live better on our planet.

Topic		Allocated time
1.	Introduction to the format of the PLD session Google Slides Link	2 minutes
2.	PISA's definition of global competence (Video - 10 min)	3 minutes
3.	SDG12: Responsible consumption and production (Discussion)	10 minutes
4.	Solutionaries (TEDx Talk 19 min) Solutionary thinking, MOGO & kids taking action	10 minutes
5.	Systems thinking	10 minutes
6.	Connected circles: Plastic drinking bottles & E-Waste (Video 5 min & 2 x Activities)	40 minutes
7.	Cause and consequence mapping & Root cause trees	5 minutes
8.	Linking SDGs and HHH	5 minutes
9.	Making coasters in India (Video)	2 minutes
10.	The Great Green Vine Invention (Book)	2 minutes
11.	TOCK.earth Kaitiaki (Song)	4 minutes

** NB: Please bring a device to work on, e.g. laptop or iPad as well as pen and paper for recording your reflections.

Sustainability and Local Curriculum Design

PLD 6 - Hā Hauora Tangata: Reconnecting with other, nature, and place

Here is an outline of what we will be doing during our first PLD session.

In this session we will:

- **Identify** sustainability themes found in picture books.
- **Explore** how picture books can be used to teach sustainability themes.

Topic		Allocated time
1.	Bingo (Activity)	5 minutes
2.	Introduction to the format of the PLD session	2 minutes
3.	Introduce the website (unfinished)	3 minutes
4.	Revise the Sustainable Development Goals - aka Good Life Goals	5 minutes
5.	Explain learning for the afternoon - picture book activity	5 minutes
6.	Read and analyse picture books (Hard copy or digital) for sustainability themes and relevance for teaching. Use GLF Pack of Actions and Curriculum Framework for the SDGs 2017 (Partner activity)	55 minutes
7.	Share picture books (Activity)	15 minutes

** NB: Please bring a device to work on, e.g. laptop or iPad as well as pen and paper for recording your reflections.

Sustainability and Local Curriculum Design

PLD 7 - Hā Hauora Tangata: Reconnecting with other, nature, and place

Here is an outline of what we will be doing during our first PLD session.

In this session we will:

- **Explore** the structure and key features of *Te ao tangata: Social sciences* refreshed curriculum.
- **Draw on** *Aotearoa New Zealand's Histories* exemplars and 'Planning in Action' resources to support unit design.
- **Create** integrated Social Sciences unit outlines grounded in sustainability and informed by the local area.

Topic		Allocated time
1.	Introduction to the format of the PLD session Google Slides Link	2 minutes
2.	Introduce *Te ao tangata: Social sciences* curriculum Download a copy of the refreshed SS currriuclum	3 minutes
3.	Discuss structure: UKD and Phases using the context, *Place and Environment.*	10 minutes
4.	Explain learning for the afternoon – unit planning	5 minutes
5.	Explain local curriculum links on Slide 4. Use ANZH in action examples and videos for planning support.	5 minutes
6.	Work collaboratively in small groups/ teams to design Social Sciences unit plans (Activity).	55 minutes
7.	Share unit plans with the whole team.	10 minutes

** NB: Please bring a device to work on, e.g. laptop or iPad as well as pen and paper for recording your reflections.

Appendix J: CPAR Phase Two Semi-Structured Interview Questions

CPAR Phase 2 - Cycle 3

Research Aim 2: To evaluate sustainability PLD and synthesize how practice arrangements in the case study school might enable sustainability education through local curriculum design.

Research Question 2: How might changes in practice arrangements further enable sustainability education and local curriculum design?

Interview Two Questions: Term 4 2022

1. Can you tell me about your understanding of
    a. sustainability;
    b. sustainability education
    c. Has your understanding shifted over the last x months? Why?

2. In what ways have you integrated sustainability education and local curriculum into your planning and design for learning over the last two terms?

3. In what ways did our PLD sessions contribute to your planning and teaching of sustainability during the last two school terms?
    a. What changes have you made to your planning and your teaching as a result of the PLD sessions?
    b. What was the impact on students and their learning?

4. Can you describe some successful teaching and learning experiences that have happened as a result of the PLD sessions?
    a. What has not worked as intended? Why?

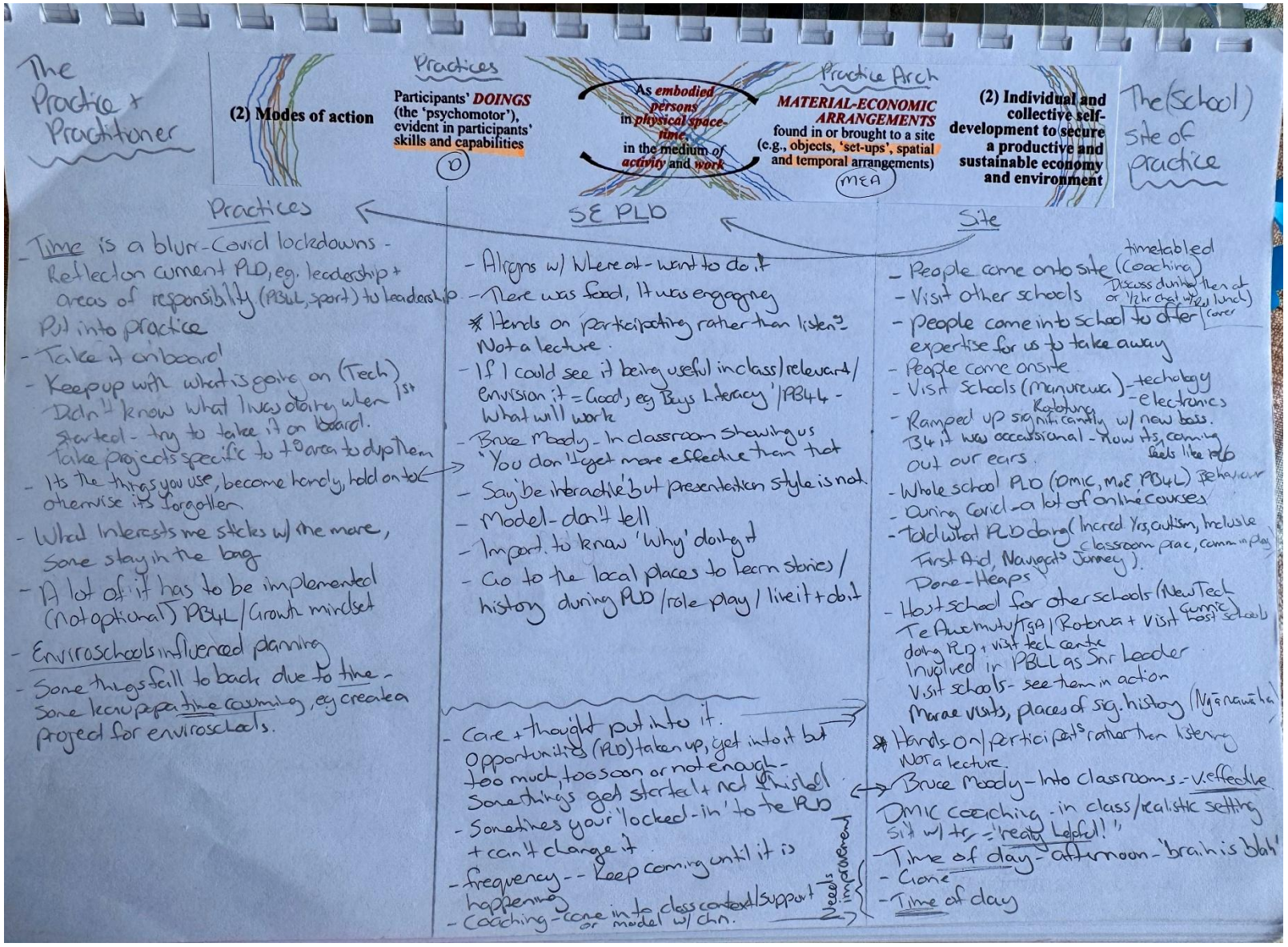
5. Looking forward to PLD for the remainder of the year, what aspects of sustainability education would you like to continue to explore? What would you like to find out more about?

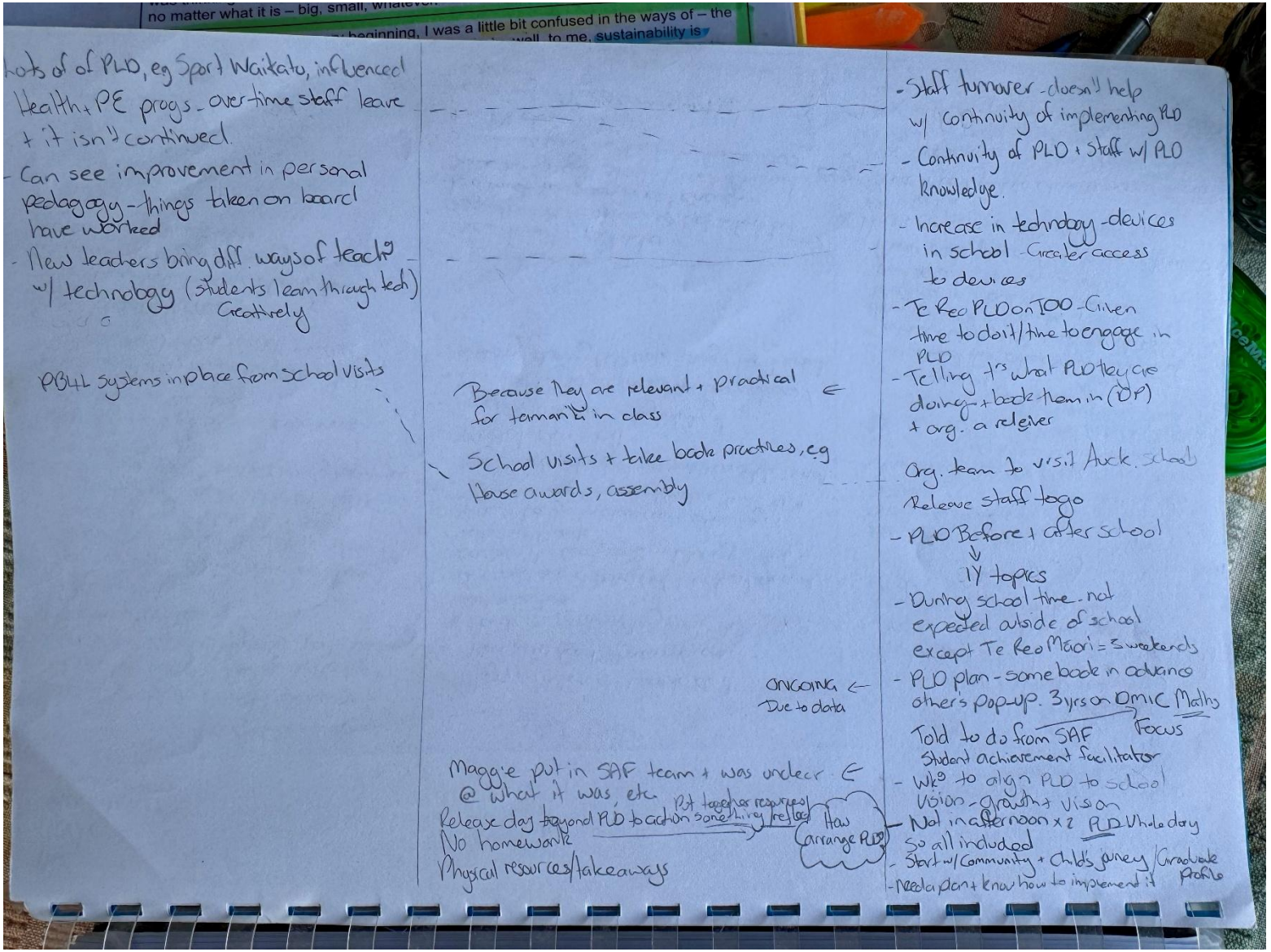
6. In what ways do you think you could be better supported to passionately engage with sustainability education and local curriculum design?

7. Is there anything else that you'd like to share in relation to the PLD related to sustainability education?

Appendix K: Sample of Practice Architectures Analysis

Focus Group One


The Practice + Practitioner
(2) Modes of action
Practices
Participants' DOINGS (the 'psychomotor'), evident in participants' skills and capabilities
As embodied persons in physical space-time, in the medium of activity and work
Practice Arch
MATERIAL-ECONOMIC ARRANGEMENTS found in or brought to a site (e.g., objects, 'set-ups', spatial and temporal arrangements)
(2) Individual and collective self-development to secure a productive and sustainable economy and environment
The (School) site of practice
Practices
SE PLD
Site
- Time is a blur - Covid lockdowns - Reflection current PLD, eg. leadership + areas of responsibility (PBL4L, sport) to leadership. Put into practice
- Take it on board
- Keep up with what is going on (Tech) - Didn't know what I was doing when 1st started - try to take it on board. Take projects specific to the area to dup them
- Its the things you use, become handy, hold on to, otherwise its forgotten
- What interests me sticks w/ me more, some stay in the bag
- A lot of it has to be implemented (not optional) PBL4L / Growth mindset
- Enviroschools influenced planning
- Some things fall to back due to time - some keep up the time coming, eg created a project for enviroschools.
- Aligns w/ where at - want to do it
- There was food, it was engaging
- Hands on participating rather than listening. Not a lecture.
- If I could see it being useful in class / relevant / envision it = Good, eg Boys Literacy / PB4L - What will work
- Bruce Moody - In classroom showing us 'You don't get more effective than that'
- Say 'be interactive' but presentation style is not
- Model - don't tell
- Import. to know 'why' don't get
- Go to the local places to learn stories / history during PLD / role play / like it + do it
- People come onto site (timetabled (Coaching) Discuss during then at or 1/2 hr chat after lunch) (cover)
- Visit other schools
- People come into school to offer expertise for us to take away
- People come onsite
- Visit schools (Manurewa) - techology - electronics
- Ramped up significantly w/ new boss. (Rebuilding) B4 it was occasional - Now its coming out our ears. feels like PLD
- Whole school PLD (DMIC, MoE PB4L) Behaviour
- During Covid - a lot of online courses
- Told what PLD doing (Incred Yrs, autism, Inclusive First Aid, Nuggets Journey). (classroom prac, comm in play) Done - Heaps
- Host school for other schools (New Tech Te Ahuwhenua / TGA / Rotorua + Visit Gunnie (host schools) doing PLD + visit tech centre
- Involved in PBL as Snr Leader
- Visit schools - see them in action
- Marae visits, places of sig. history (Ngāmanawa)
- Care + thought put into it. Opportunities (PLD) taken up, get into it but too much, too soon or not enough - Some things get started + not finished
- Sometimes you're 'locked-in' to the PLD + can't change it
- Frequency - - Keep coming until it is happening
- Coaching - come in to class context / support or model w/ chn.
Needs improvement
- Hands-on / participants rather than listening. Not a lecture.
- Bruce Moody - Into classrooms - v. effective
- DMIC coaching - in class / realistic setting - Sit w/ them = 'really helpful!'
- Time of day - afternoon - 'brain is blah'
- Clone
- Time of day


no matter what it is – big, small, whatever
beginning, I was a little bit confused in the ways of – the
well, to me, sustainability is
lots of of PLD, eg Sport Waikato, influenced Health + PE progs - over time staff leave + it isn't continued.
- Can see improvement in personal pedagogy - things taken on board have worked
- New teachers bring diff. ways of teach w/ technology (students learn through tech) Creatively
PB4L systems in place from school visits
Because they are relevant + practical for tamariki in class
School visits + take back practises, eg House awards, assembly
ONGOING ← Due to data
Maggie put in SAF team + was unclear @ what it was, etc
Release day beyond PLD to action
No homework
Physical resources/takeaways
Put together resources
How arrange PLD
- Staff turnover - doesn't help w/ continuity of implementing PLD
- Continuity of PLD + staff w/ PLD knowledge.
- Increase in technology - devices in school - Greater access to devices
- Te Reo PLD on TOD - Given time to do it / time to engage in PLD
- Telling trs what PLD they are doing + back them in (DP) + org. a reliever
Org. team to visit Auck. schools
Release staff to go
- PLD Before + after school
↓
1Y topics
- During school time - not expected outside of school except Te Reo Maori = 3 weekends
- PLD plan - some book in advance other's pop-up. 3 yrs on OMIC Maths
Told to do from SAF
Focus
Student achievement facilitator
- Wk 9 to align PLD to school vision - Growth + Vision
- Not in afternoon x 2 PLD. Whole day so all included
- Start w/ Community + Child's journey / Graduate Profile
- Need a plan + know how to implement it

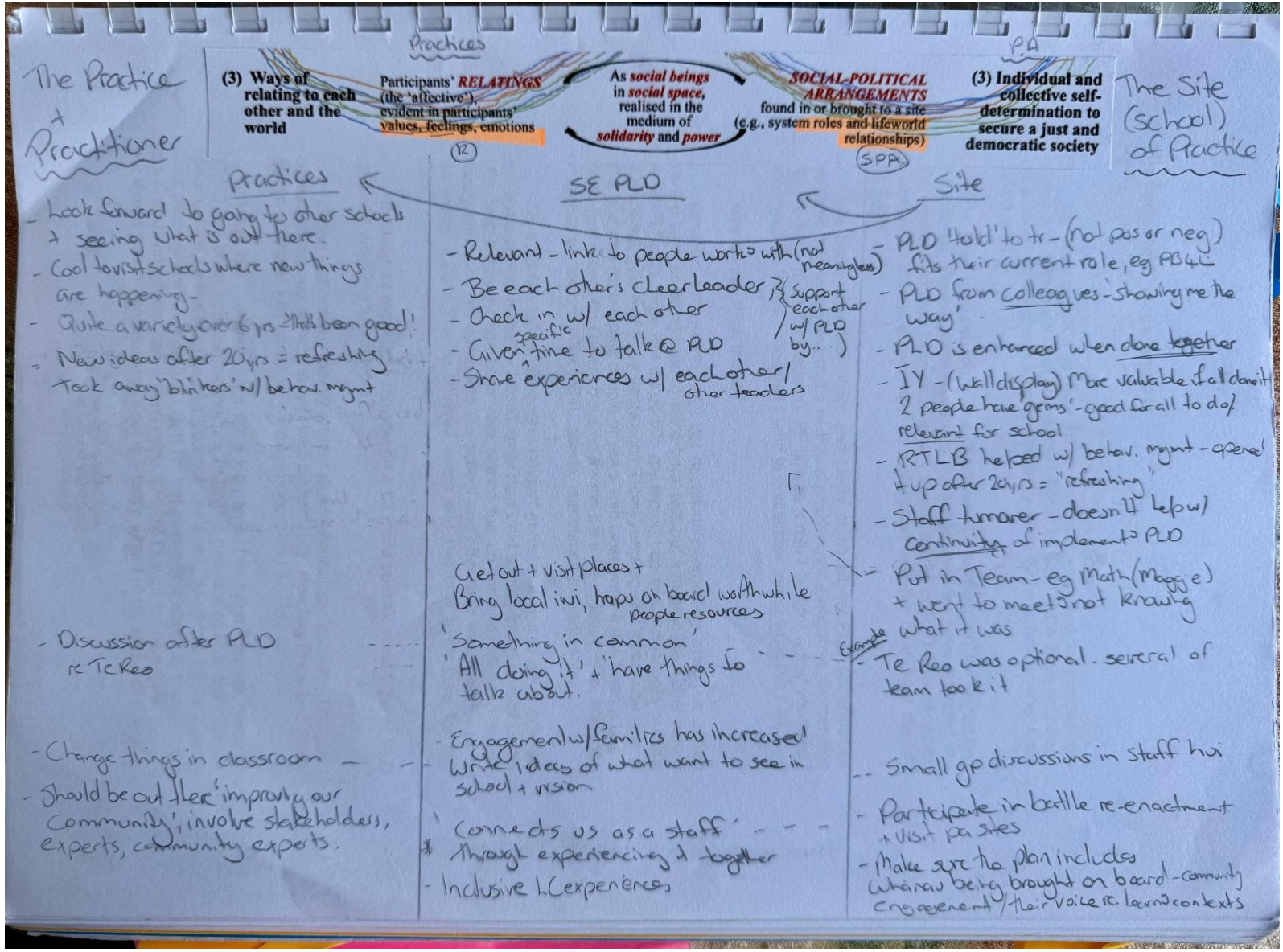
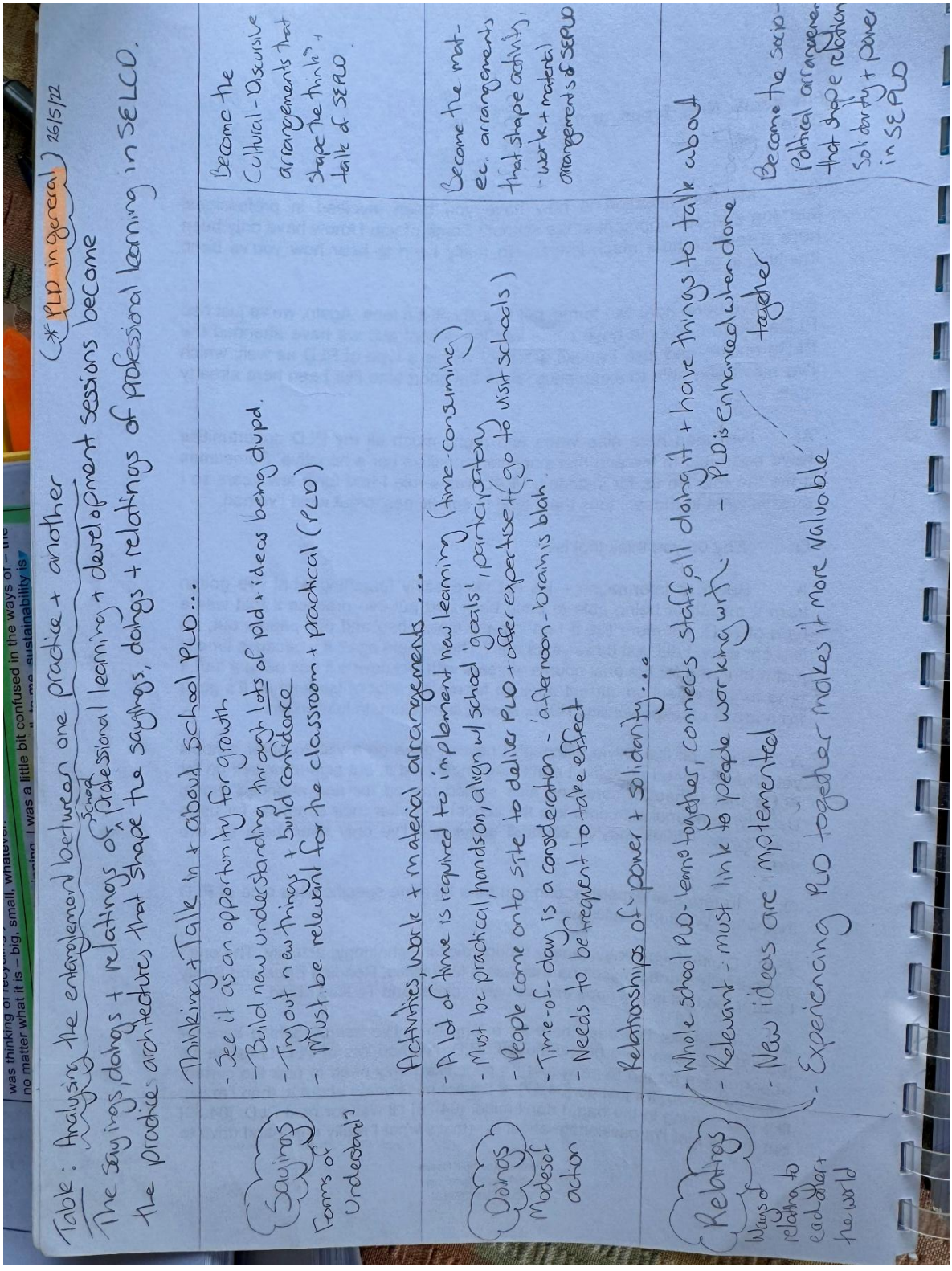

Practices
PA
The Practice + Practitioner
(3) Ways of relating to each other and the world
Participants' RELATINGS (the 'affective'), evident in participants' values, feelings, emotions
(R)
As social beings in social space, realised in the medium of solidarity and power
SOCIAL-POLITICAL ARRANGEMENTS found in or brought to a site (e.g., system roles and lifeworld relationships)
(SPA)
(3) Individual and collective self-determination to secure a just and democratic society
The Site (school) of Practice
Practices
SE PLO
Site
- Look forward to going to other schools + seeing what is out there.
- Cool to visit schools where new things are happening.
- Quite a variety over 6 yrs - that's been good!
- New ideas after 20 yrs = refreshing
Took away 'blinkers' w/ behav. mgmt
- Relevant - links to people work[s] with (not meaningless)
- Be each other's cheerleader, (support each other w/ PLO by...)
- Check in w/ each other
- Given specific time to talk @ PLO
- Share experiences w/ each other/ other teachers
- PLO 'told' to tr - (not pos or neg) fits their current role, eg PB4L
- PLO from colleagues - 'showing me the way'.
- PLO is enhanced when done together
- IY - (wall display) More valuable if all done it 2 people have gems' - good for all to do/ relevant for school
- RTLB helped w/ behav. mgmt - opened up after 20 yrs = "refreshing"
- Staff turnover - doesn't help w/ continuity of implement[n] PLO
- Put in Team - eg Math (Maggie) + went to meet/not knowing what it was
- Te Reo was optional - several of team took it
- Discussion after PLO re Te Reo
- Change things in classroom
- Should be out there 'improving our community', involve stakeholders, experts, community experts.
Get out + visit places +
Bring local iwi, hapu on board worthwhile people resources
'Something in common'
'All doing it' + 'have things to talk about.
- Engagement w/ families has increased
- Write ideas of what want to see in school + vision
'Connects us as a staff'
* through experiencing + together
- Inclusive L Experiences
Example
- Small gp discussions in staff hui
- Participate in battle re-enactment + visit pa sites
- Make sure the plan includes whanau being brought on board - community engagement / their voice re. learning contexts

Table Example: Analysis of Entanglement Between Practices

Focus Group One



Appendix L: Data Codes

Data Analysis Codes

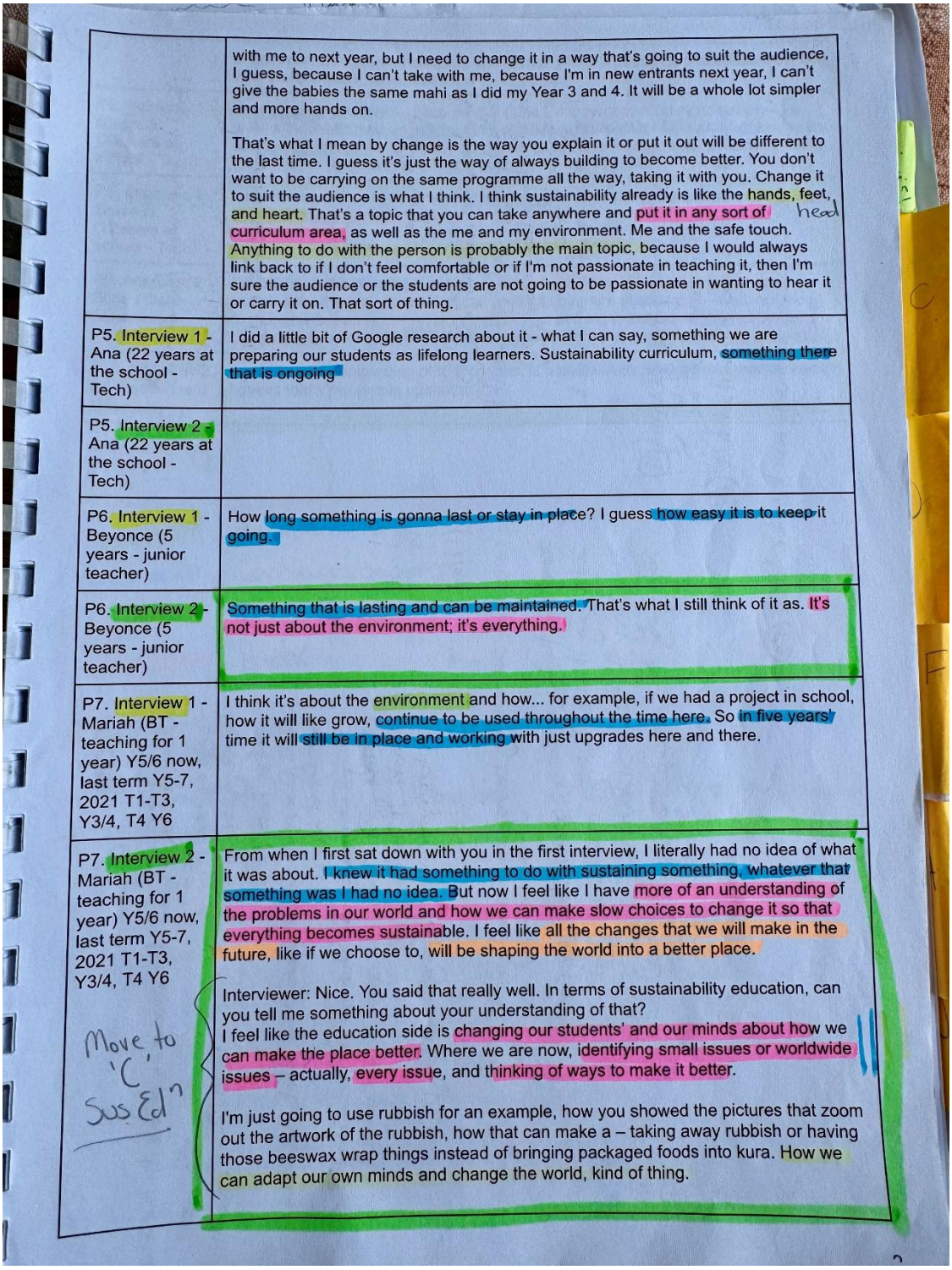
Understanding (U)	
Environment (e)	Local and Global (lg)
Cultural (cl)	Connections (cnct)
Social (s)	Relevant/ Citizens (cz)
Economic (ec)	Embedded in school (em)
Continuous/ Ongoing (o)	Unsure (u)
Indigenous perspective (k)	Open to learning (ol)
Lifelong learning (lll)	
Planning (Influences) (P)	
Flexible/ Open (fo)	Try new things (tnt)
Government influence (g)	Collaboration (c)
Student achievement (sa)	Meaningful (m)
Enviroschools (ev)	Outcomes (o)
Kahui Ako (KHA)	Online (www)
Other PLD (opld)	Student centred (sc)
Covid (cv)	Local curriculum (lc)
Community Connection (CC)	
Desire to link with community (d)	Local curriculum (lc)
Local marae (i)	Community input (ci)
Covid barrier (cv)	
Teaching (T)	
Citizenship (cz)	Relevant (r)
Questions/ How? (q)	Practical skills (p)
Indigenous (i)	Group work (gw)
Hands on (ho)	Future focused (ff)
Tuakana Teina (tt)	Holistic (h)
Reflective (r)	Pedagogy (pg)
Community focused (cf)	Aspirations (a)
Unsure (us)	Student-led (sl)
Modelling (m)	Action (ac)

Resources (R)	
Self (sf)	People (p)
Online (o)	Ready made Packs (m)
Digital (d)	
Local Issues (LI)	
Environment (e)	Cultural (C)
Covid Impact (ci)	Social (s)
Teaching Content (TC)	
Environment (e)	Social (s)
Cultural (c)	Economic (ec)
Interconnected (i)	New Zealand Curriculum (nzc)

Appendix M: Sample of Coding and Thematic Analysis

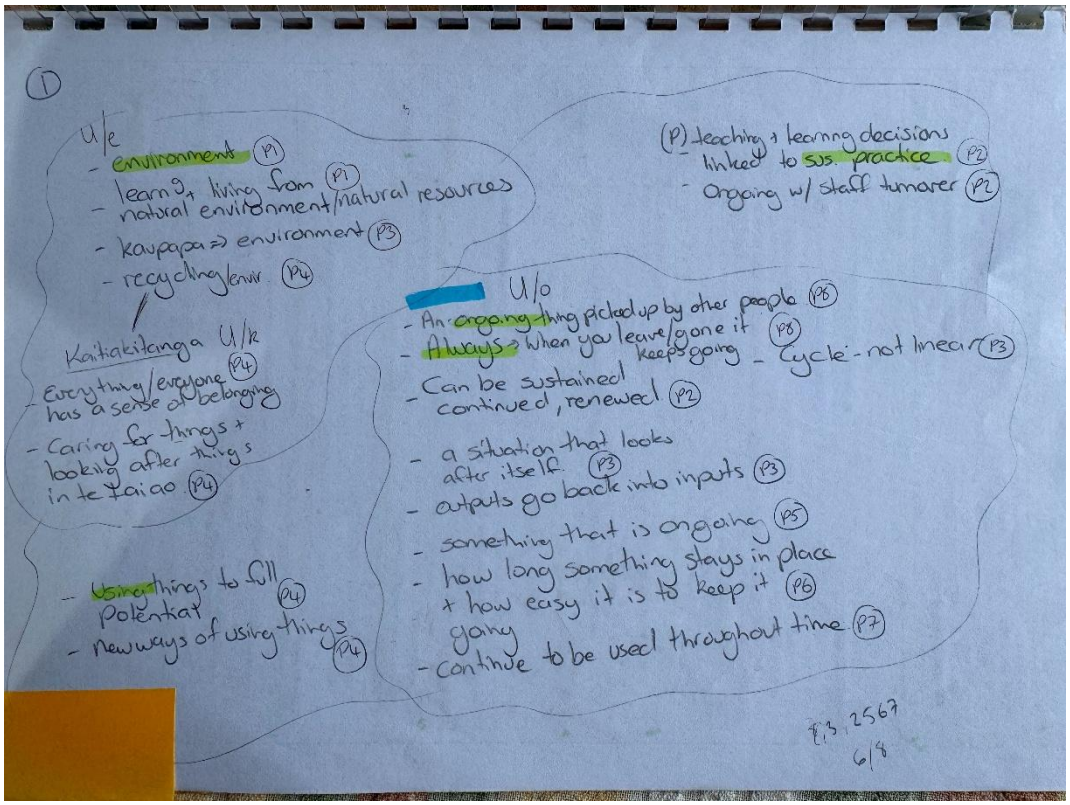
Interview One and Two Transcript Coding

B	Int 1 - Q1a: Understanding of sustainability (red) Int 2 - Q1a: Understanding of sustainability
P1. Interview 1 - Alicia (Year 0-2)	…"is natural resources and using things in our environment to learn from and to I guess live from, or live off" e.g. recycling food waste school gardens. Using natural resources in every day learning (junior class)
P1. Interview 2 - Alicia (Year 0-2)	It's kind of similar to when I started, but I guess from the PLD that we've done it's kind of been driven more into the environmental aspect, our local whenua aspect, and pretty much how our future tamariki, like our future can look after and preserve and appreciate where we live, what we have. That kind of is what I've got out of this, how can we inspire our future generation to carry on looking after and upholding what we have?
P2. Interview 1 - Rangi	...it's something that can be sustained, so whatever it might be it can be continued; it can be renewed, renewable. Okay so maybe in a school context, and it's one thing I used to hear a lot, we were part of PB4L and so all our incentives and behaviour management, every decision we made we were always told is this sustainable practice? Is it something that can still happen if there's high staff turnover?
P2. Interview 2 - Rangi	My understanding. Sustainability is something or the concept of something being maintained over time. Being not, I suppose to think of the opposite, not depleted.
P3. Interview 1 - Mr T	When we initially found out about your kaupapa, I thought it was about environmental sustainability, so I know a lot about that. To be sustainable would be to be in a situation that looks after itself, that it doesn't – whatever the outputs are, they go back into it as the inputs. So it's a cycle rather than a linear thing where you get something and then you get something else, and you've got to keep drawing from somewhere. Sustainable would be whatever your outputs are, they just lead back into it again, so you're not having to keep drawing from somewhere else.
P3. Interview 2 - Mr T	To be honest, it hasn't changed much from the first thing I said. It's all about future proofing and ensuring everything is better than how we found it, I guess, or all the same. That goes for everything, not just the environment. Interviewer: When you say not just the environment, what are you talking about? Interviewer: When you say not just the environment, what are you talking about? Relationships, the community. Every aspect of your life.
P4. Interview 1 - Cardi (Was Year 4 and 5 last term and now Year 3 and 4)	Sustainability I'm just thinking, I'm just thinking I don't really know the big word as such because I'm more confident in Te Reo Maori speaking. All these kupu, all these words are quite new to me, especially in the education sector. Is that like the recycling? (Prompted with kaitiakitanga) Kaitiakitanga looking at the guardianship of things and ensuring that everything or everyone has a sense of belonging and yeah, really just looking at more so the caring of things, like being able to look after simple things within our taiao, within our environment. I just think anything in particular that we're making sure that... it could be as simple as just the water bottle, making sure that it's being used to its full potential let's say, or we're just not... because it's empty now we have no use of it, then we're just chucking it in the bin. Finding ways to create a home or a new way of using this – I guess it's sort of I'm trying to... only because I was thinking of recycling you see (laugh). Just ensuring that everything has a place, no matter what it is – big, small, whatever.
P4. Interview 2 - Cardi (Was Year 4 and 5 last term and now Year 3 and 4)	At the beginning, at the very beginning, I was a little bit confused in the ways of – the different ways that I interpreted it. Now I know that... well, to me, sustainability is something that is ongoing, that we can reuse, utilise, with changes. It's not going to be the same old way all the way through. We're going to change it to suit the time, is what I've noticed.Interviewer: When you say change it, can you give me an example of what it might be that you've changed? As in we might have the resources about me and my environment. I did the recycling thing with my kids and now I can take that

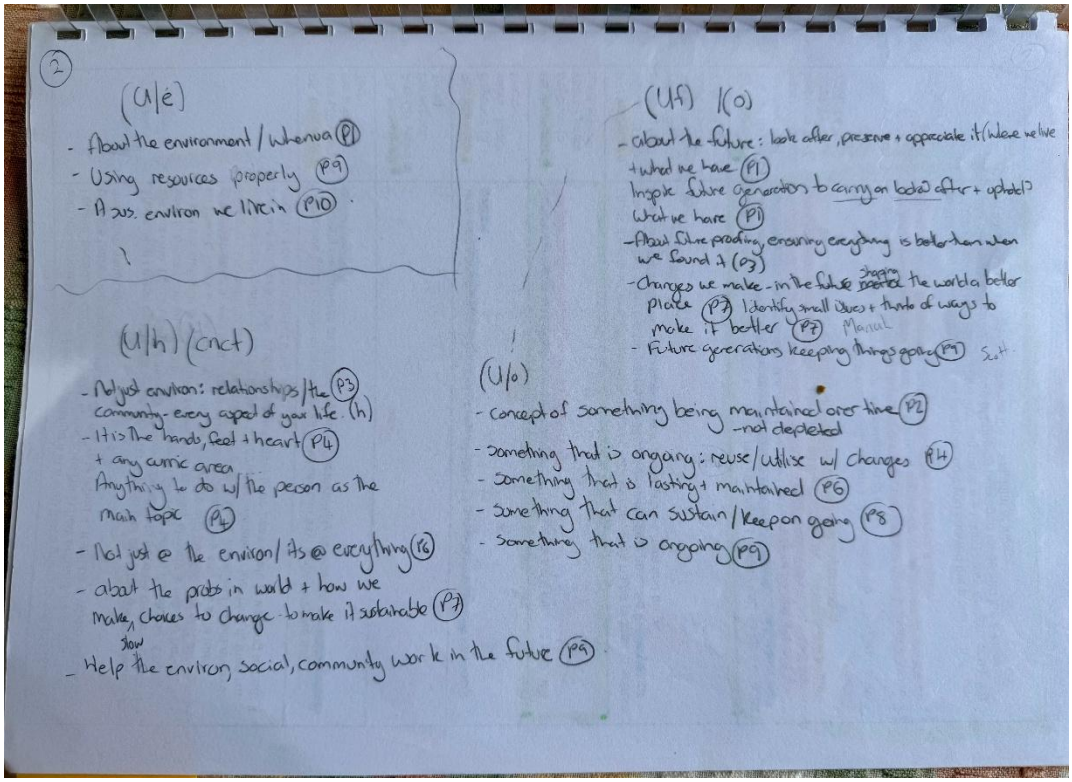


	with me to next year, but I need to change it in a way that's going to suit the audience, I guess, because I can't take with me, because I'm in new entrants next year, I can't give the babies the same mahi as I did my Year 3 and 4. It will be a whole lot simpler and more hands on. That's what I mean by change is the way you explain it or put it out will be different to the last time. I guess it's just the way of always building to become better. You don't want to be carrying on the same programme all the way, taking it with you. Change it to suit the audience is what I think. I think sustainability already is like the hands, feet, and heart. That's a topic that you can take anywhere and put it in any sort of curriculum area, as well as the me and my environment. Me and the safe touch. Anything to do with the person is probably the main topic, because I would always link back to if I don't feel comfortable or if I'm not passionate in teaching it, then I'm sure the audience or the students are not going to be passionate in wanting to hear it or carry it on. That sort of thing.
P5. Interview 1 - Ana (22 years at the school - Tech)	I did a little bit of Google research about it - what I can say, something we are preparing our students as lifelong learners. Sustainability curriculum, something there that is ongoing
P5. Interview 2 - Ana (22 years at the school - Tech)	
P6. Interview 1 - Beyonce (5 years - junior teacher)	How long something is gonna last or stay in place? I guess how easy it is to keep it going.
P6. Interview 2 - Beyonce (5 years - junior teacher)	Something that is lasting and can be maintained. That's what I still think of it as. It's not just about the environment; it's everything.
P7. Interview 1 - Mariah (BT - teaching for 1 year) Y5/6 now, last term Y5-7, 2021 T1-T3, Y3/4, T4 Y6	I think it's about the environment and how... for example, if we had a project in school, how it will like grow, continue to be used throughout the time here. So in five years' time it will still be in place and working with just upgrades here and there.
P7. Interview 2 - Mariah (BT - teaching for 1 year) Y5/6 now, last term Y5-7, 2021 T1-T3, Y3/4, T4 Y6 Move to 'C, Sus Ed'	From when I first sat down with you in the first interview, I literally had no idea of what it was about. I knew it had something to do with sustaining something, whatever that something was I had no idea. But now I feel like I have more of an understanding of the problems in our world and how we can make slow choices to change it so that everything becomes sustainable. I feel like all the changes that we will make in the future, like if we choose to, will be shaping the world into a better place. Interviewer: Nice. You said that really well. In terms of sustainability education, can you tell me something about your understanding of that? I feel like the education side is changing our students' and our minds about how we can make the place better. Where we are now, identifying small issues or worldwide issues – actually, every issue, and thinking of ways to make it better. I'm just going to use rubbish for an example, how you showed the pictures that zoom out the artwork of the rubbish, how that can make a – taking away rubbish or having those beeswax wrap things instead of bringing packaged foods into kura. How we can adapt our own minds and change the world, kind of thing.

Interview One Question One Themes

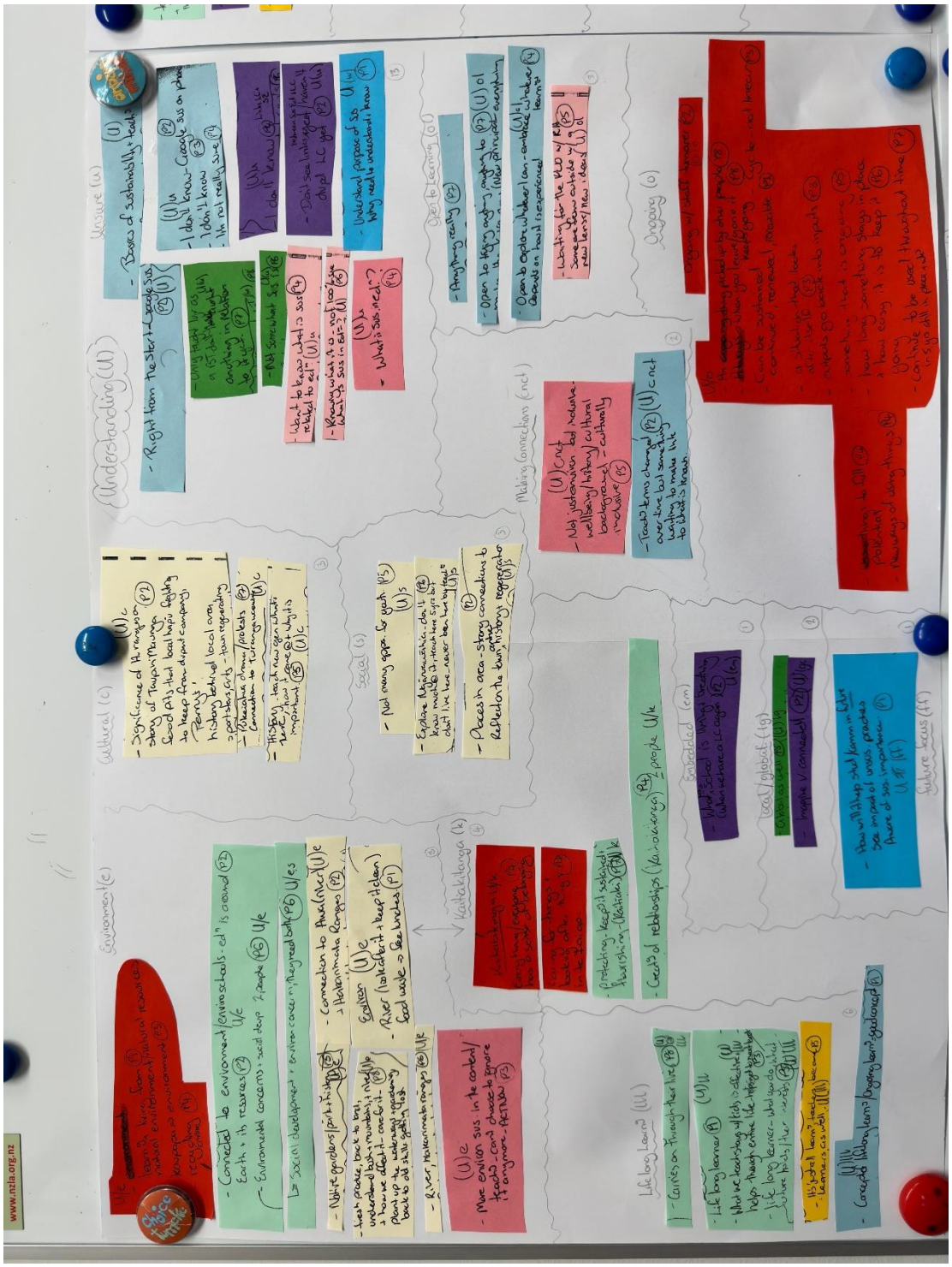


Interview Two Question One Themes

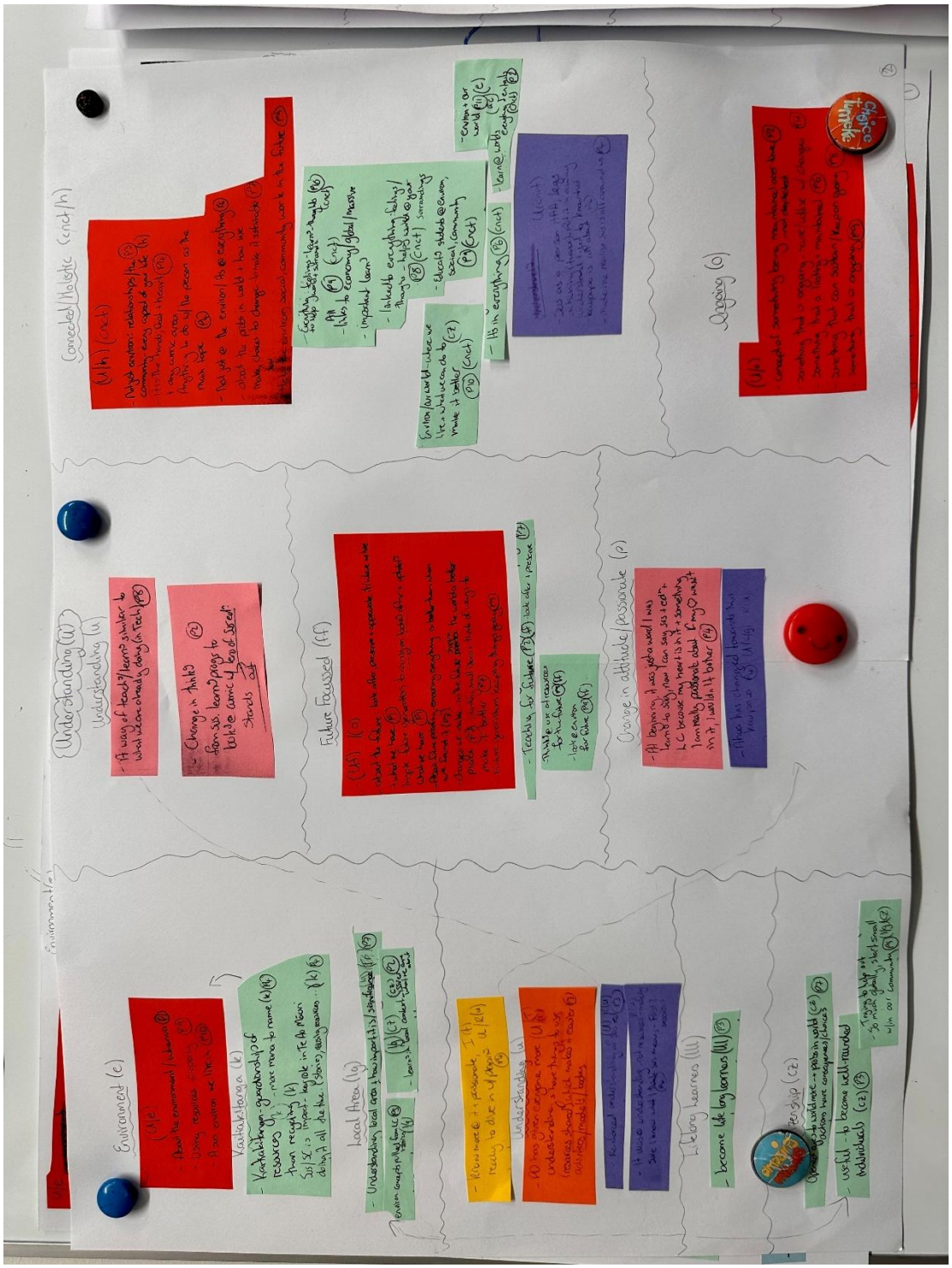


Checking Themes across Questions

Interview One



Interview Two



Appendix N: Data Summary

Interview One, Focus Group One, Focus Group Two

Summary of Participant's Interview 1 (Document 1)

What characteristics of sustainability education are evident in the school?

Understanding of sustainability:

- ongoing, lasting, can be continued or kept going, renewed, renewable
- it's about the environment (including using natural resources)
- using things to their full potential
- a cycle of outputs and inputs

** Much of the understanding here and through all questions is drawn from Enviroschools PLD

Understanding of sustainability education:

- relevant and meaningful to students lives – they take it home
- learning stays with children throughout their lives – lifelong learners
- about environmental concerns
- about social concerns
- about educating the whole person
- students as change agents/ problem solvers – able to make changes to their world
- education for the future
- projects to make things better
- kids teaching other kids – making learning sustainable

** Several teachers were not sure about this – when prompted with 'kaitiakitanga' gave a response

Topics taught related to sustainability education:

- connection to land and local area
- meaningful planning with context related to children and the community

Environmental *(mostly in Tech.)*

- river
- plastic
- ocean
- gardening
- composting
- worm farms
- biotechnology
- living things
- zero waste
- rongoā
- global warming
- carbon footprint

Social/ Cultural/ Political

- connection to local area/ community/ marae (Kīngitanga, koroneihana, Matariki, whakapapa)
- events in the local area
- keeping safe, me in my environment
- becoming familiar with the local area
- Tuakana-Teina

Economic

- consumerism *(Tech)*

** Many themes from Enviroschools

Links between sustainability education and local curriculum design:

- developing our local curriculum
- must be embedded in school culture
- need a framework to use/ follow
- must be 'buy in' – everyone a part of it – collaborative
- it's about the choices we make
- connections to Māoritanga/ Kīngitanga – build connection with local marae
- Tech curriculum based on Te Matauranga o Aotearoa

** Several teachers were unsure how to answer this

How is information found?

- online (6)
- people (4)
- staff/ teachers (3)
- social media (3)
- PLD (2)

How is planning done?

- on a journey to establish a biannual plan
- basic
- from a concept
- dictated by PLD & curriculum coverage (Enviroschools, DMIC)
- term by term, lock down changed planning
- plan at end of term for next term
- plan a key integrated unit or kaupapa with a NZC learning area focus
- allow for flexibility to follow student leads
- ideas come from children's interests
- starts with a question to students
- full staff planning – collaborative
- teachers as learners
- planning from Enviroschools
- relevant to students
- use TKI and information found online

Resources used:

- family/ whanau (3)
- Enviroschools folder (2)
- staff members/ conversations (2)
- online/ TKI (2)
- marae
- worksheets
- Chromebooks
- YouTube videos
- TV
- phone

Successful teaching and learning approaches related to sustainability education:

- hands on experiences/ practical (5)
- ideas from PLD (3)
- questioning/ wonderings/ KWL (2)
- conversations/ discussions (2)
- Enviroschools (2)
- reflection (2)
- going to places
- inquiry/ communities of inquiry
- group work
- integration of digital tools
- breakout blocks
- integration of digital tools
- breakout blocks
- include community/ community input
- lesson timing/ pace
- students knowing what they are learning (Learning Intention)
- observation feedback
- using toys/ objects
- play-based
- connect to something/ context/ problem

** Not specific to sus. ed. pedagogy

** "starting at ground zero due to changes in staffing"

Aspects of sustainability education to explore during PLD:

- not sure, anything, don't know
- open to try anything, open to explore whatever I can, embrace what ever learning I can
- basics of sustainability/ right from the start
- see it, like it, use it
- join/ connect with marae/ community/ Tūrangawaewae
- work in/ with the community
- local area – including history
- carbon footprint (depth)
- rongoā
- lifelong learning/ ongoing learning as a concept
- knowing what whanau want for their children
- what it was like before European settlement
- local curriculum

Local issues:

Environmental

- our river/ state of the river/ how to look after it and keep it clean
- food wastage from free lunches
- Hakarimata Ranges
- Taupiri maunga
- food pits down the road (Pukeiāhua)
- fresh produce/ back to the land
- understanding the bush/ mountains/ river and how we affect it, e.g., planting up the waterways
- getting back to old skills that are getting lost

Social/ Cultural/ Political

- significant places in our area and their history
- the arts and sports people in/ from the community
- attendance/ whānau support/ whānau engagement, involvement
- separation in the community 'us' and 'them'
- not many opportunities for our youth
- connection to Tūrangawaewae Marae

Economic

- local businesses have closed

Learning priorities for school context:

- purpose of sustainability and why
- how sustainability will help the community in the future
- Māori achieving success as Māori
- connecting with Tūrangawaewae Marae
- sustainability of people
- attendance
- involved in the community and with the community
- community as facilitators
- knowing who I am and where I am from (history of place)
- Social Sciences – Where from? Growing up? Special Places?
- courage to take risks
- confidence to follow a process

Support needed to passionately engage with sustainability education and local curriculum design:
• support from the top (SLT) which is already happening • having some basic lesson ideas • concepts related to our community/ relevant to context • someone to support us to put it into a classroom plan • supported to make the start/ start the conversations • know what direction the community wants us to take the kids in and support to make it happen • exploring it, doing it, getting in there and giving it a go rather than hesitating or weighing it up • want to know what sustainability is around education • work with the Tūrangawaewae Marae and the college and the Waikato Raupatu Lands Trust, the businesses who do tours on the river (they do waka huia and tell you about the river) • get local people to tell the stories of the area/ the maunga • topics like rongoā, to understand tikanga and follow it • someone from outside with a new lens • good PLD with different topics to investigate
Anything else?
• There should be a lot more environmental sustainability – we choose to ignore it and it is not something we can ignore any more. We need to act now. • Just want to know sustainability around education. • It's not only about our environment but inclusive – our wellbeing, the history, the students' cultural backgrounds, culturally inclusive. • Happy our school is integrating it. • Not enough outdoor education – go away as a whole school, e.g., to Lake Taupō or Raglan – it inspires students to look after the land, etc.

Summary of Focus Group 1 Discussion

Understanding Professional Learning and Development (PLD) structure within the school to assist in planning PLD related to sustainability education and local curriculum design

	Sayings	Doings	Relatings
Structure	• working as a collective – trying new things • coaching was helpful	• given time to do it/ engage in it • PLD before and after school (Te Reo Māori in the weekends) • coaching (in class) • timetabled time for discussion after coaching round • relievers booked for cover to give time for discussion (after coaching) • timetabled/ booked in advance (planned) • ongoing PLD rather than one off, e.g., mathematics for 3years • not in the afternoon/ end of day is difficult • entire day PLD • school and community • a plan for implementation • observe/ model/ support teachers during lessons • time to talk about lessons • give feedback on implementation • release days after PLD to put together resources, etc. and reflect on learning • whanau and tamariki also on journey • consistency and regularity is key	• everyone doing it together • part of school community/ culture • something in common • working together • moving forward together • time to talk about PLD • embedded in the culture of the school (S,D,R)
Content	• relevant • practical • changes in the way 'we' speak (e.g., about chn.) • change in language used in teaching • PLD relates to growth and vision • opportunities for students to grow and become 'amazing humans' • PLD to align with what is happening in the school, re. vision… • can be refreshing – an unfamiliar perspective or way of doing things	• aligns with school vision • systems implemented because of PLD • PLD to align with school vision and strategic plan, 'what we're doing' • practical • relevant to school • specific PLD has been based on data • structure of local curric. and student experiences • Aotearoa NZ Histories • transferable to classroom	• moving together towards the school vision, charter, goals • consider graduate profile, e.g., child's journey through school • embedded in the culture of the school (S,D,R)
Facilitation	• practical • changes in the way 'we' speak (e.g., about chn.) • change in language used in teaching • using subject specific language • getting to the 'why' (e.g., children's behaviour) • opportunities to grow • enjoy it if enthusiastic about the subject • you use what sticks with you • the topic must be interesting • things that are practical are kept; others forgotten • can feel overwhelmed if there is not enough time • personal pedagogy improved through PLD	• doing it – hands on • participation in PLD is important • resources to take away • visiting other schools for inspiration • field trips • role play • stories of significant places • outside orgs/ experts involved, e.g., council • physical resources not online resources • engaging • modelling, not telling • if too time consuming – falls over	• lots of discussion • engagement with families has grown • discussion at staff hui leads to changes in classrooms • collaborating with community • involve external organisations/ experts, e.g., council • check in with each other • share learning with each other • give whanau and tamariki voice • see it working well – working with facilitator • staff turnover can make it hard to maintain consistency of learning

Summary of Focus Group 3 Discussion

Understanding Professional Learning and Development (PLD) structure within the school to assist in planning PLD related to sustainability education and local curriculum design

	Sayings	Doings	Relatings
Structure	• Taking opportunities throughout the day and having conversations and changing the way we talk with them to be problem-solvers and thinkers about things and how things can impact other things. That's been really good. • The head and heart and hands has typically been the winner. There's no point in doing anything unless you know why you're doing it. That's the same with the kids as well. The kids are very much why? What's the point? Why? So that heart is very much the big thing and I never really thought of it that way. It was just why. There wasn't a motivator for it. It was just why. So that's been really good. It's made me look at things and go well I have to put that in it, you know, rather than just this is what you do. • Easily integrate sustainability in everything • All have grown together	• I guess my thinking is more at this stage around the planning side of it, not just the ebb and flow of being able to talk about sustainability and bring in sustainability thinking, but actually the planning for it. • Need time to actually explore all the resources that are out there and use them • A lot of PLD in many topics • New focus in teaching related to problem solving • Sometimes too much time between sessions -would like some solid day blocks of PLD	• I think the planning for it still is time in the sense that – so I'd be thinking about next year in the sense that like calling planning meetings or any hui on top of the hui we already have. • But I think we could eventually get to a point where we would appreciate that actually if we have a day, two days, where we're just laying it all out on the table, putting it out there, thinking through the steps we think might happen along the way, is actually beneficial for it to be successful within our classrooms and with the tamariki, so it's changing our practice. • Hard to keep consistency with people being sick • Keen to share expertise within the team
Content	• Having a hook or something that springboard's children's thinking. • It's changing the way we're thinking. We've restarted weeding our own garden and things like that, so we have done some action already, but I think just changing the way we think, act, and speak first and getting that kind of flow going and then the specific planning will come. • We have to know what is going on locally • Taking problem solving into practice • Fits well with Kāhui Ako and Enviroschools work • Because it is meaningful – you can use it	• Resources you've shared with us, we've been able to use them like immediately, e.g. video of plastic whale • Linked with Science • Doing lots of recycling • Action is linked to knowledge and values as well – they have to know why we recycle • Looked at your picture of the drains and how they did the paintings around them, and the kids today were looking in the drains and were like, look, whaea, there's all the rubbish in our drain, and they spoke about how the drains lead to the ocean and then they talked about the impact it's going to have. But with the pākiki, a lot of kōrero around problem-solving is at the heart of sustainability and even just getting them more to solve their problems rather than whaea, duh, duh. So I'll say what can you do or how can you solve this problem?	• Real holistic way of looking at learning • Positive affirmations • Shared values •
Facilitation	• Staff - hear them kōrero after the PLD and actually take action from it straightaway has been great. • Want to look at the picture books in one session	• The things that you've shared in terms of – not rethinking, but in the way that planning can happen. I'm ready to see how we can work that into the way that we plan • Using the head, heart and hand in the classroom - hit them with the knowledge and then make sure that they're also thinking with their hearts, and then actioning, like doing something. • The head, heart, and hands thing's been really good. • The resources too, we've used them straightaway • PLD slides were useful – immediate access to resources • Would like a one-stop-shop for resources and planning support • A session looking at resources would be beneficial	• Willingness to engage – on the journey together

Appendix O: Glossary of Māori Kupu (Vocabulary)

Te Reo Māori	English
ako	to learn and to teach / reciprocal learning from each other
ākonga	students
Aotearoa	New Zealand
awa	river
hangarua	recycling
hapū	subtribe based on familial ties
hauora	health/ wellbeing
hikoi	walk
iwi	people/ tribe
kaitiaki	guardians
kaitiakitanga	guardianship/ stewardship/ caretaking
kaupapa	vision/ purpose
kete	carrying basket often woven from flax
kūmara	sweet potato
kura	school
mana	prestige
manākitanga	hospitality & respect
manatiaki	stewardship
marae	traditional Māori meeting ground/ community centre
Mātauranga Māori	traditional Māori knowledge
mauri	life force, vital essence

Te Reo Māori	English
ngāhere	bush
pūrākau	stories/ local narratives
rangatiratanga	chieftainship, autonomy and the right to exercise authority and self-determination
rongoā	traditional Māori medicine / healing using native plants
tamariki	children
Tangata whenua	the Māori, people of the land
taniwha	guardian spirits
tautoko	support, uphold
Te ao Māori	Māori worldview
Te Tiriti o Waitangi	New Zealand's founding document – partnership between Māori and the British Crown
Te Taiao	the natural world
tikanga	Māori customs and traditional values
turangawaewae	place to stand
wairua	health & spirit
waka	canoe
whakamā	shy
whakapapa	Māori genealogical framework
whakataukī	Māori proverb
whānau	family
whānaungatanga	relationship/ kinship/ family connection
whare	house/ meeting house

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