Climate strike experiences: Youth voice informing secondary schooling in Aotearoa New Zealand.

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Abstract

Youth voices led the climate strikes of 2019 and motivated millions to take to the street and demand climate action. Aotearoa New Zealand is experiencing more frequent and devastating weather events such as flooding, cyclones, droughts and fires, evidence of the Intergovernmental Panel on Climate Change's assertion that if greenhouse gas emissions continue to go unchecked, the impacts on humans and ecosystems will be irreversible, pervasive, and severe. Furthermore, those least responsible for the causes of climate change are likely to be the most affected. This includes the youth of today.

Despite the predicted scale of the impact climate change might have on future generations, academic literature relating to youth concerns and perceptions on climate change education has also been limited. While this research largely confirms what is already known about climate change education in secondary schools, it has focused on youth perspectives, and this is where the value lies by offering a theoretical contribution to pedagogical practise based on the voices of youth climate strike leaders. Education traditionally mirrors the cultural norms of society and secondary schools have not shown a willingness to engage with their youth about climate change education.

This thesis is grounded in a Freirean theoretical position, the context of which, supports an education process that enables students to become agents of change and argues for greater implementation of holistic critical pedagogies in secondary schools. The 2019 climate strikes represented an uprising of youth, through this action the strike leaders' experiences led to their realisation that climate instability necessitates an educational shift away from prioritising cultural reproduction to an education system that supports cultural transformation. With a critical theory lens, I explore the barriers and opportunities within secondary schools in regard to climate change education and ask what teachers can learn from the climate strikes experience.

The purpose of this research was to consider youth voice and question what educators can learn from the climate strikes by exploring the experiences of climate strike leaders in Aotearoa New Zealand. Understanding the motivational factors behind youth climate action and gaining pedagogical insights into effective climate change education is critical to future curriculum content and classroom practices. Using an interpretivist paradigm with a critical theory lens, rich qualitative data were collected. In-depth, semi-structured interviews with 15

geographically and culturally diverse climate strike leaders and eight secondary school teachers were conducted via zoom. Interview data were triangulated by document analysis of online media articles relating to the climate strikes. Thematic analysis identified key emerging messages.

The key findings identified in this research pertained to *why* and *how* questions. The *why* consisted of motivational factors that engaged youth to take climate action which included the soaring levels of climate anxiety among youth and how eco-anxiety is pivotal for demotivating or motivating climate action. With consideration of Boler's (1999) conceptual framework, the Pedagogy of Discomfort, I propose a progressive model of emotional responses that frame the strike leaders' emotional journey from apathy through anxiety to action. The conceptual framework aims to be transformational by inviting individuals to explore the root causes behind their anxiety and develop active strategies that encourage participants to reflect and identify, their perceptions and society's expectations.

The *how* considered the value of youth voice for increasing engagement; how enhanced understanding of social justice and indigenous rights is more likely to engage youth towards political agency than learning about ecological collapse; and how enhanced political agency empowers youth to feel they can make a difference, which also reduced their anxiety. Importantly, embracing Orr's (1992) critical pedagogical practice that balances academic (head), emotional, (heart), and practical (hands) learning is more likely to foster critical thought that engages a wider audience with climate change education that leads to climate action.

The strike leaders concluded that formal secondary school education plays an essential role for their future but is yet to fully realise the transformative potential it has. Youth are demanding climate action and argue that educators have a responsibility to support and contribute to bringing about the changes needed for the ecological and societal challenges youth face in a climate altered future.

Dedication

This doctoral thesis is dedicated to my late parents, Barrie Read Bright and Jean Elizabeth Bright who nurtured my appreciation and love of the land and fostered in me an understanding that anything is possible with perseverance and dogged hard work.

This thesis is also dedicated to my children, Jackson, Ella, and Phoenix - they are the future.

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I am hugely grateful to my academic supervisors who encouraged and challenged me to think more critically, enhance my writing skills, publish, present, and generally go beyond what I thought I was capable of. To Chris Eames, thank you for your knowledge and expertise with climate change and climate change education, your humour and gentle guidance that encouraged me to step outside my comfort zone. To Elizabeth Reinsfield, your attention to detail, timely replies to my queries, and general support has both comforted and encouraged me through this journey. To librarian support, Alistair Lamb, for his technical support, enthusiasm, humour, and ability to deftly empower my digital skills without making me feel incompetent, I thank you.

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Publications and presentations

Bright, R. (2021, October). Climate strikes. The collective power of youth, social justice, and ecopedagogy. North American Association for Environmental Education virtual symposium round table.

I prepared a 20-minute PowerPoint presentation via zoom based on my findings. The presentation was followed by a short discussion.

Bright, R. (2021, October). Climate strikes. Youth voice, social justice and ecopedagogy.

A 15-minute presentation via zoom of my findings for the Division of Education Postgraduate Symposium. Hamilton, New Zealand.

Bright, R., & Eames, C. (2020). Climate strikes: Their value in engaging and educating secondary school students. *Set: Research Information for Teachers* (3), 4-11. doi:10.18296/set.0180

This paper was based on the initial findings of my research, I was the primary author, drafting and editing the paper. I collaborated with Chris Eames, who as my supervisor, advised and helped with editing.

Bright, R., & Eames, C. (2021). From apathy through anxiety to action: emotions as motivators for youth climate strike leaders. *Australian Journal of Environmental Education*, 1-13. doi:10.1017/aee.2021.22

This paper was based on elements of my research, I was the primary author, drafting and editing the paper. I collaborated with Chris Eames who as my supervisor, advised and helped with editing.

Everth, T., & Bright, R. (2022). Climate change and the assemblages of school leaderships. *Australian Journal of Environmental Education,* 1-20. doi:10.1017/aee.2022.8

This paper was a collaboration with Thomas Everth based on findings from our respective doctoral research findings. I contributed data and discussion based on youth perspectives and Thomas focused on teacher perspectives. We each contributed written sections of the paper, Thomas, as the primary author, collated the contributions, drafted and edited the paper.

Everth, T., Bright, R., Morey, C., dePetris, T., Gaze, S., Barker, A., . . . Eames, C. (2021). Building capacity for climate change education in Aotearoa New Zealand schools. *Set: research information for teachers (Wellington)*(2), 40-45.

This paper was a collaboration of academics from the University of Waikato who met regularly on zoom to discuss the content and edit this paper. Thomas Everth was the lead author who drafted and edited the contributions. My contribution reflected theoretical understanding gained from my research.

Eames, C., Gurney, L., Everth, T., Morey, C., Bright, R., DePetris, T., . . . Gaze, S. (2021). *Submission to the Climate Change Commission's Draft Advice*. University of Waikato

This paper was a collaboration of students, teachers, and academics from the University of Waikato who are working in the climate change education field. We met regularly on zoom to discuss and edit this paper. Chris Eames as lead author coordinated the group, drafted key elements and coordinated the writing contributions. My contribution included being involved in the discussions and a small written piece based on my thesis work.

Contents

List of figures

List of tables

Chapter One: Introduction

1.1 Introduction

> I used to think that the top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that with 30 years of good science we could address the problems. But I was wrong. The top environmental problems are selfishness, greed and apathy… and to deal with these we need a spiritual and cultural transformation and we scientists don't know how to do that. (Speth, 2015)

Anthropocentric climate change driven by unprecedented levels of greenhouse gas emissions, is the most profound challenge facing humans and the biosphere stated the Intergovernmental Panel on Climate Change (IPCC, 2018). Despite scientists, for decades, warning of the devastating impact climate change will have on humans and ecosystems, individuals and society have largely shown reluctance to address the causes of climate change. The 2019 climate strikes were a phenomenon that demonstrated the collective concern of youth about climate inaction.

At policy level, the Aotearoa New Zealand government has now acknowledged the urgency of climate change by declaring a Climate emergency (2019) and passing the Climate Change Response Zero Carbon Amendment Act (2019). This legislation documents an expectation that the long-term target of net-zero emissions by 2050 will be met by domestic action (Ministry for the Environment, 2021a). To help enable this, the government established a National Commission for Climate Change. Its vision, stated in the *Climate Change Commission Report* (Climate Change Commission, 2021), identifies and outlines a need for a thriving, climate-resilient and low-emissions Aotearoa New Zealand. In order to meet this low-emissions future, the *Emissions Reduction Plan* (Ministry for the Environment, 2022a) recognises that action is needed to meet the emissions budget, and the *National Adaptation Plan (Ministry for the Environment, 2022b)* considers the impact climate change will have on current and future populations. It offers a roadmap that directs the types of change needed within communities, industries and infrastructure. The climate crisis is deeply political and these policy documents signal growing awareness of the need for significant systemic change.

Less apparent, however, is the consideration of planning for how society will be encouraged to *culturally* shift away from the carbon intensive and environmentally disconnected lifestyles

that are responsible for this crisis. Importantly, the above reports lack significant reference to formal education and the vital role learning has to promote the increased understanding needed to support the attitudinal shifts required for climate action.

It is not surprising that secondary schools that are yet to significantly engage in climate change education (Bolstad, 2020a). The current refresh of *The New Zealand Curriculum* and *Te Marautanga o Aotearoa* (Ministry of Education, 2021c) aims to provide more relevant and future-focused guidelines for educators. This presents opportunities for improved curriculum integration, and enactment of effective climate change education.

Youth anxiety around a climate-altered future is being increasingly acknowledged to impact student wellbeing and is compounded by youth perceptions that adults have abandoned their responsibilities towards providing their children with a safe and prosperous future (Bright & Eames, 2021; Verlie & Flynn, 2022). Heightened citizen awareness is essential for advancing climate action (Hayward, 2021). It is with this in mind, that educators must respond to the needs, and therefore the voices, of youth for the future wellbeing of our communities.

This research was designed to develop insight into youth voices about climate change and climate change education. It offers a theoretical contribution to critical pedagogies through the exploration of youth voices to better inform educators on *how* to offer learning with a focus that is relevant to youth and supports regenerative and just transitioning practices that progress society towards a zero-carbon culture.

1.2 Context of the inquiry

Climate change is here (Ilisko, 2018; IPCC, 2022a; Ministry for Primary Industries, 2017). The UN Secretary-General António Guterres called climate change a ‘code red’ for humanity. The threat to the planet and human wellbeing created by the anthropocene (an unofficial unit of time that describes human impact on climate and ecosystems) (Albrecht, 2020), is unequivocal and the window to restrict the soaring greenhouse gas emissions and predicted impacts is *rapidly* closing (IPCC, 2022a). The Intergovernmental Panel on Climate Change, established in 1988 has consistently declared that climate change will be irreversible, pervasive, and severe on people and ecosystems if greenhouse gas emissions continue unchecked.

Despite the compounding effects of climate change, there is a lack of international and national funding for the implementation of adaptation and mitigation strategies (Morrison, 2022). For decades, debate and procrastination have thwarted understanding and action that is needed to mitigate and adapt to, what is largely, an uncertain future. This is partially because the scale

and complexities of climate change appear daunting thus contributing to governmental and individual inaction (Rapley, 2013). Furthermore, the fundamental behavioural and attitudinal changes required are often stymied by denial and a drive to protect the status quo (Irwin, 2020; Kwauk, 2020). As awareness of a potentially perilous future grows, youth are communicating feelings of being cheated, and are rebelling (Harrē, 2020; Hickman et al., 2021). Their position was evidenced globally when millions of students, many too young to vote, galvanised and coordinated their actions to protest climate inaction and to send a powerful political message.

The first national climate strike in Aotearoa New Zealand occurred on 15th March 2019. It occurred in many locations, including all major cities. There was criticism that the strike had been inadvertently planned for the same day as the annual Pasifika Festival in Auckland, an important festival for Māori and Pasifika youth and therefore excluded an essential youth sector from attending the Strike. Strike leaders acknowledged their planning had lacked foresight and, in an attempt, to encourage greater cultural diversity for future strikes, held planning meetings at different locations and provided free transport to the second and third climate strikes. The March strikes also occurred on the same day as the devastating Christchurch Mosque attacks, Aotearoa New Zealand's worst mass shooting. The media coverage of these strikes was understandably overshadowed by the massacre. The second coordinated climate strike occurred on May 29th at 24 different locations around the country. The third strike on September 27th saw a considerable increase in protestors with 170,000 student and adult strikers participating in over 45 locations, making it the largest youth protest in Aotearoa New Zealand's history (Deguara, 2019).

The Aotearoa New Zealand movement was initiated by Sophie Handford, Year 13 Kapiti College student who was aware of the growing global climate strike movement (MacManus, 2021). When Handford realised there was no Aotearoa New Zealand chapter she created a Facebook page, Instagram and a website to raise further awareness. Within a week 40 students from schools throughout the country volunteered to lead climate strikes in their region. This initial core team met weekly via Zoom to coordinate and organise the climate strikes.

In this study, I acknowledge the United Nations definition of youth, as being in a transitionary period (of adolescence) between a dependent childhood and independent adulthood. By doing so, the elasticity of the age of youth can vary, and is represented as being developmental - according to the cultural context and societal perspectives of human development. For statistical purposes, however, the United Nations identified youth as between the ages of 15-24 years (United Nations, n.d-b).

Adolescents' needs have changed in recent years, unlike the schools that serve them (Irwin, 2020; Kwauk, 2020). Today's youth, despite being the least responsible for the causes of climate change, are potentially the greatest victims (IPPC, 2019; Ojala, 2015; Winograd, 2016). Yet, when students reach adolescence, their interest in, and concern around environmental issues often decreases (Eames et al., 2018; Olsson & Gericke, 2016). To predicate the issue, most secondary schools are currently *not* engaging students in environmental education or climate change education (Bolstad et al., 2015; Everth & Bright, 2022; Tattersall et al., 2022). Research into environmental education and climate change education in Aotearoa New Zealand secondary schools, to this point, has been limited (Bolstad, 2020a; Bolstad et al., 2015) and the research undertaken has largely focused more on *what* was happening rather than *why* or *how* students were engaged (Aikens et al., 2016; Irwin, 2020).

Engagement is presented here as an external manifestation of motivation. There is a strong correlation between student's engagement in their education and improved learning outcomes (Christenson, 2012). Engagement is more than just academic performance – engaged students will self-regulate, contribute, thrive from challenging themselves and persist towards a goal. For engaged students learning is a joy. Engagement occurs at multiple levels in the secondary school community, with the individual teacher and subject matter, as well as with learning strategies used within the class (Wang & Degol, 2014).

The current *New Zealand Curriculum* echoes recommendations from the progressive founding environmental education document, *The Belgrade Charter (UNESCO, 1975)* to support a vision of "young people who will be confident, connected, actively involved, lifelong learners" (Ministry of Education, 2007b, p. 7). Within the *New Zealand Curriculum* is recognition of five key competencies; thinking, using language and symbols, managing self, relating to others, participation and contributing, which are deemed necessary for living and lifelong learning. Values such as ecological sustainability and principles that promote the need for future focus and community engagement are also considered important. These aspects of *The New Zealand Curriculum* support climate change education. Undermining the intent, however, is a vague expectation and the voluntary nature of environmental or climate change education; contributing to a minimal and inconsistent level of engagement with climate change education in secondary schools (Bolstad et al., 2015; Everth et al., 2021).

The inclusion of climate change education in school curricula then, to date, largely depends on the school's governing arm, the Board of Trustees (Ministry of Education, 2015a), and school leadership (Everth & Bright, 2022). Climate change education can be considered controversial with components that induce anxiety (Bright & Eames, 2021) as well as challenging

communities by advocating for changed behaviours that may negatively impact economic prosperity and lifestyles. Such barriers mean it is often only the most motivated, and perhaps courageous, teachers who will attempt climate change education (Everth & Bright, 2022; Plutzer et al., 2016; Verlie et al., 2020). This sporadic approach to climate change education in Aotearoa New Zealand secondary schools was decried by climate strike youth leaders attending the Auckland University SDG workshop, signalling that students know the importance of, and want to prioritise such learning (Glasgow, 2019). The call for secondary schools to revolutionise the purpose and practice of education that prioritises climate change education is growing (Everth et al., 2021; Kwauk, 2020; McPhail, 2016; Verlie & Flynn, 2022). It appears however, that many practitioners, simply do not know *how*.

Improving classroom efficacy involves supporting and enhancing educators' understanding of students' unique and important perspectives (Berryman & Eley, 2018; Bolstad, 2020c; Cook-Sather, 2018). Aotearoa New Zealand's geographic isolation, colonial history, and bi-cultural founding document, Te Tiriti o Waitangi (Treaty of Waitangi) provide particular challenges as well as exciting opportunities for climate change education (Ministry of Education, 2015c; Smith, 2020). Currently, however, there are many barriers to climate change education in secondary schools and teachers who attempt to address climate change education in their classrooms often feel isolated and unsupported (Bolstad, 2020a; Brignall-Theyer et al., 2010; Verlie et al., 2020). Critical consciousness invites individuals to critique and analyse political, social and economic systems, linking their knowledge with *action* (Freire, 1985).

As public awareness around the urgency for climate action has increased so has the call, within educational research, to explore the efficacy and development of climate change education (Chang & Pascua, 2017; Verlie & Flynn, 2022). Given that adolescents have been identified as less receptive and more pessimistic about pro-environment education compared to their primary aged students (Eames & Barker, 2011; Ignell et al., 2019; Monroe et al., 2019; Olsson & Gericke, 2016), further investigation into how secondary schools discourage or empower student engagement with climate change concerns is integral to future change (Bolstad, 2021a; Fredricks et al., 2019; Ng, 2018).

Formal education has a critical role to play in growing awareness of the diverse challenges and possibilities associated with climate change (Bolstad, 2020a; Everth & Bright, 2022; Verlie, 2022). As climate change awareness grows, so too must our understanding of effective, relevant, and engaging climate change education. Without education, it is unclear how the population will develop the values, knowledge and skills needed to innovate and implement adaptive and mitigating solutions that aim to reduce the impacts of climate change (IPCC,

2022a). Exploring the valuable insights provided by youth voice aims to respond to this question and contribute to an increasingly dynamic field of research.

1.3 Research question and aims

I sought to explore the youth perceptions and experiences of climate change education in secondary schools with a particular focus on their role as climate strike leaders, and to gain an understanding of the motivational forces behind their action. The purpose of this qualitative research was to gain greater insight into educators' understanding to better cater for secondary school students' needs in regards to climate change education.

The research was guided by the following questions:

i) Why now? What has motivated and engaged students to take climate strike action in 2019?

ii) How does participation in the climate strikes influence understanding of climate change and motivate action?

iii) What are student and teacher perceptions of educational outcomes for youth who participated in the climate strikes?

iv) What are the implications for future climate change educational practice in secondary schools?

Adolescents' interest in environmental issues are reported to decline during secondary school (Eames & Barker, 2011; Olsson & Gericke, 2016), and secondary schools are not actively encouraging students to engage with learning about climate change (Bolstad, 2020a; Irwin, 2020; Verlie & Flynn, 2022). Nevertheless, in 2019, the climate strike leaders motivated thousands of youths to protest climate inaction. Given the elevated levels of engagement shown during the climate strikes, it is timely to explore the perspectives of strike leaders to highlight *how* climate change education at secondary school-level might be improved. The teacher perspectives, some of whom were school leaders and who had observed or managed student participation during the climate strikes, were also sought.

Adolescents are under-represented in studies regarding climate change concerns even though they are key to climate change action in the future (Everth et al., 2021; Lawson et al., 2019). Although climate change can seem abstract to students who have not personally experienced its impacts (Markowitz et al., 2018), youth actions have the potential to instigate societal and

behavioural change (Stevenson et al., 2016). The climate strikes presented a significant opportunity to explore *why* and *how* strike leaders became engaged in climate action with a view to make recommendations on classroom engagement and pedagogy. The strikes also provided an opportunity to explore educators' perceptions into *why* and *how* youth were motivated to take climate action. The aim of this research was to enhance understanding of engagement with climate change education in secondary schools. It was anticipated that the findings from this research would offer practical insights and 'next steps' for developing climate change education capacity in secondary schools, to empower wide-spread and sustained climate action in Aotearoa New Zealand.

1.4 Researchers background and motivation

The motivation for this research was the result of my experiences as a secondary school teacher and environmental educator, combined with a life time interest and respect for the delicate balance between humans using and abusing their environment. I grew up on a steep hill country farm in Aotearoa New Zealand where the planting of trees and management of waterways was required to mitigate erosion. Later in life I raised children in a basic dwelling on a rural block in Northland where our food sources were mostly derived from our small patch of land or the sea. These experiences fostered my understanding of the interconnection between ecological balance and human wellbeing.

I continue to live in Northland, which is one of the most economically deprived areas in Aotearoa New Zealand (New Zealand Statistics, 2018). Low socio-economic areas are projected to be disproportionately affected by vulnerable infrastructure, food insecurity, and housing challenges associated with a changing climate (Bennett, 2014) - further increasing societal inequities. As a secondary school teacher of social studies and geography at a large co-educational Northland school for 15 years, I facilitated outdoor education opportunities and initiated a youth-led environmental group. There was some support from school leadership for the extra-curricular environmental group but activities and opportunities were often constrained by time, lack of financial support and students' other academic priorities.

I loved teaching adolescents and found them to be passionate and enthusiastic learners. I utilised the opportunities available within the social studies and geography curriculum to include issues of environmental sustainability within my teaching programmes. Enabling learning opportunities outside the classroom appeared to heighten engagement but inside the classroom the engagement of students who were usually interested and motivated tended to decrease when environmental issues were introduced.

As the public narrative concerning climate change intensified, the political and social implications for communities and the potential challenges for secondary schools became more apparent. I considered such learning to be vital for "confident, connected and actively involved learners" (Ministry of Education, 2007b, p. 7) to foster a greater understanding among *all* students and potentially lead to wide-scale problem solving and innovation around the environmental challenges facing humanity. However, it seemed that environmental education that included climate change education suffered from gaps in understanding, particularly when educators sought information about *how* to appropriately engage students in the classroom environment (Busch, 2018; McNamara, 2013). Enhancing educator's understanding of how to better engage students in their learning about environmental understanding and climate change education seemed a critical area and worthy of research. The 2019 climate strikes reiterated the need to gain urgent insight into youth experiences and perspectives and provided a means to explore classroom engagement with climate change education.

1.5 Structure of thesis

This thesis is organised into six chapters with Chapter One providing an overview that outlines the context, rationale, aims and background for the research.

Chapter Two reviews the literature and considers the theoretical base to build a deeper understanding of the context from which the research is based. This includes using a critical theory lens to consider the problem of climate change and historical global, national and localised responses to climate change. It provides background to climate change education and its potential barriers. Youth anxiety, youth and climate action, and youth engagement are discussed. The literature on leadership in Aotearoa New Zealand schools and relevant pedagogies are reviewed. Finally, the theoretical framework for this research is outlined.

Chapter Three describes the methodological framework for the research. It explains the research design and provides contextual information concerning the research setting, the research participants, qualitative data collection and data analysis. Issues pertaining to the trustworthiness of the research are presented here.

Chapter Four presents the findings about *why* the strike leaders were motivated and engaged with climate action. It provides context and background information on the participants (n=23) and reports the findings thematically. The themes highlight students' motivation and engagement with the climate strike. It also discusses why students choose not to participate in the strike.

Chapter Five presents the findings concerning learning as an outcome of the climate strikes and *how* this was achieved. It outlines the key competencies that participants perceived strike leaders exhibited during the strikes and the media sources that students were most likely to pursue for knowledge. The findings on secondary school structures and pedagogies are presented in terms of their impact on the climate change educational content. Finally, the barriers to climate change education are discussed.

Chapter Six focuses on the prominent themes resulting from the research and considers what secondary school educators might learn from these findings. It outlines the theoretical implications of this research for practice, policy, and further research.

Chapter Two: Literature Review

2.1 Introduction

The choices we make today will define how those who live tomorrow and beyond will fare (Santone, 2018). The youth engagement during the 2019 climate strikes provided a day of reckoning for both climate inaction and educators. By exploring the motivational forces and educational outcomes of the climate strikes, educators may gain a better understanding of the range of ways they might provide impactful climate change education.

This chapter reviews literature with the intention of providing a background to the impacts of climate change, as well as the formalised responses to climate change at global, national, and localised levels. The psychological and structural barriers to climate change action are considered. To provide context to this research the barriers to climate change education both internationally and within Aotearoa New Zealand are discussed. The significant role of leadership in transformational climate change education is introduced before focusing on the growing anxiety of youth and how they are progressing climate action. The role of Greta Thunberg is considered along with the climate strikes, political literacy, social justice, and indigenous knowledge. Finally, critical pedagogical practices are considered such as, pedagogy of discomfort, ecopedagogies and action competence in order to examine the complex and critical journey of implementing climate change education.

The terminology used in this research, and represented in the literature reviewed, shares a common purpose of drawing attention to the relationship between humans, their resources, and the planet. *Environmental education* (EE) is an umbrella term that has focused attention on environmental issues (Palmer 2002). *Education for sustainable development* reflects a Western neoliberalist (ideas associated with the free-market capitalism) ideology that asserts sustainability must fit within development goals, thereby contradicting the view societal processes are needed to address biodiversity loss and adapt or mitigate climate change (Tulloch, 2016). *Education for sustainability* focuses back on environmental concerns, signally that sustaining ecosystems is no longer enough, and that regenerative practices are now urgently needed (UNESCO, 2021). The regenerative practices necessitated by climate change and biodiversity loss (which are interconnected) demand swift and dramatic societal change. Impactful *climate change education* explores scientific and societal reasons underpinning the urgent need for transformation and fosters innovative thinking for future possibilities. Because of its transformative potential, and the specific focus on the issue of climate change, c*limate change education* is my preferred term, and will be predominantly used in this research.

This review considers what is known about climate change and climate change education and the place of the climate strikes within this. The implications for education in Aotearoa New Zealand are also considered.

2.2 Climate change – what is the problem?

Climate change is a term that has become synonymous with foreboding. The Intergovernmental Panel on Climate Change (IPCC) advises that since the nineteenth-century industrial revolution, global temperatures have risen one degree as a result of the increased release of greenhouse gases, such as carbon dioxide, methane, nitrous oxide, and fluorinated gases into the atmosphere (Armstrong, 2018; IPCC, 2014). This increase has been attributed directly or indirectly to human activities. Unofficially, this has led to some assert that we are now in a new geological epoch called *the Anthropocene,* representing the period during which humans have negatively impacted vital planetary systems (Albrecht, 2020; Steffen et al., 2018). The increased greenhouse gases in our atmosphere have contributed to an altered global atmosphere, in which an enhanced greenhouse effect is occurring, and leading to global warming. The impacts of global warming are thought to include increased temperature trends that are causing ice mass loss, sea-level rise, sea acidification, changes in flower and plant propagation, and extreme global weather events (Steffen et al., 2018). If current levels of greenhouse gas emissions are not reduced, global temperatures are predicted to rise by at least two degrees Celsius above pre-industrial temperatures. Such an increase could occur in less than 25 years and will be irreversible (IPCC, 2018; Zenghelis, 2016).

Historical apathy to take climate action combined with a global population of seven billion and a largely industrialised world indicates the impact of rising temperatures on humans and other species will be profound (IPCC, 2018).

The IPCC asserted that climate change will be irreversible, pervasive, and severe on people and the ecosystems if greenhouse gas emissions continue to go unchecked (IPPC, 2019). The predicted impacts include;

- Increased incidence of extreme weather events (flooding, storm surges, and droughts)
- Breakdown of critical services and infrastructure, particularly in cities and coastal regions
- Breakdown of food systems contributing to a heightened risk of food insecurity
- Increased mortality and ill-health from extreme heat events
- Increased risk of water and food-borne diseases

- Greater risk of people being displaced and associated conflict
- Increased loss of terrestrial and marine ecosystems and species

More recent research indicates that as the climate warms, weather predictions may become more complicated, less reliable, and with a shorter lead-in time (Sheshadri et al., 2021). This is a concern for many who rely on weather forecasts as part of their livelihood or for recreation, for example, farmers and sailors. Less predictability also implies less accuracy for warning systems of extreme weather events. The substantial social and economic burdens associated with a warming planet are projected to increase inequality and impact more on poorer communities (Carleton & Hsiang, 2016). Low socio-economic areas are disproportionately affected by vulnerable infrastructure, food insecurity, and housing challenges (Bennett, 2014). Climate change is not just an environmental issue but also a matter of social justice. A more accurate description, suggests Noronha (2013) is we are facing a climate crisis.

In Aotearoa New Zealand, the National Climate Change Risk Assessment Report (Ministry for the Environment, 2019) advised that the consequences and impacts of climate change will be far-reaching for not only the natural environment but also infrastructure, the economy, and governance. While Aotearoa New Zealand's share of gross emissions is small, at 0.17%, due to our economic reliance on agriculture (which contributes approximately 5% to Aotearoa New Zealand's Gross Domestic Product) (Ministry for Primary Industries, 2019), per head of capita, we contribute more harmful gases than other industrialised countries. Aotearoa New Zealand emits 16.9 tonnes of carbon dioxide per person compared to, for example, the United Kingdom which emits 7.1 tonnes of gross carbon dioxide per person (Ministry for the Environment, 2021b).

The changing nature of our climate, freshwater, and marine systems has been monitored by The National Institute of Water and Atmospheric Research (NIWA) using reliable, long-term data (NIWA, 2019). Aotearoa New Zealand's gross emissions have increased by 19.6% since 1990 and are now at the highest level in at least 800,000 years. Three of the past five years have seen temperature records top the temperature charts since records began. The 2018 average temperature for the Tasman Sea was recorded at six degrees warmer than previous annual averages. Ocean acidification has increased by 30% in the last 250 years and is predicted to increase by 200% before 2100. Economically, extreme weather-related costs to Aotearoa New Zealand in the past five years have exceeded $800 million (NIWA, 2019). Without expedient action, the impacts of climate change are potentially devastating; environmentally, socially, and economically. As a result of climate change, Aotearoa New Zealand's primary industries will potentially experience:

- Changes to growth and potential harvest on both the land and sea
- Unpredictable weather cycles
- Regional variation in crop productivity
- Increased rain, resulting in erosion, sedimentation in our waterways, soil loss, and loss of productivity
- Changes to our vulnerability to pests and disease (Ministry for Primary Industries, 2019)

The profound implications of projected climate change require urgent attention to apply forward-thinking adaptation and mitigation responses at global, national, and local scales (Archie et al., 2018; Harker et al., 2017) because these are essential to build resilience for a climate-altered future.

2.3 **Response to climate change.**

Mitigation and adaptation are complementary strategies which are key to managing and reducing the impacts of climate change. Both require government action on a global, national, and local scale - as well as cooperation from the public (McGrath, 2021; Semenza et al., 2008). Mitigation approaches attempt to reduce the impacts of climate change, whereas adaptation strategies are more specific; they respond to an expected or actual event and principally target that vulnerable system (Carter, 2019a). Education, while currently underexploited, is critical to improving populations' understanding of why mitigation and adaptation strategies are vital and how to most effectively utilise them (Anderson, 2012). A brief outline of key global, national, and local responses that have attempted to address mitigation of climate change follows.

2.3.1 **Global response**

The warming effect of carbon dioxide emissions has been speculated on since the 1850's when experiments conducted by scientist, John Tyndall, identified that atmospheric gases could transmit and absorb radiant heat resulting in a theory that "terrestrial rays" had the potential to alter the energy balance of the Earth (Armstrong, 2018, p. 10). Since the late 19th century, scientists have suspected human induced greenhouse emissions could impact the climate, but it was not until the 1970's that scientific opinion, led by the World Meteorological Organization (WMO), expressed concern and openly supported the position that the planet is warming (IPCC, 2022b; Jackson, n.d). Table 2.1 below outlines the major international conferences tasked, since then, to address environmental issues such as climate change.

Table 2.1

Key global conferences in response to climate change

1972	United Nations Conference (first Earth Summit). Sweden	This conference marked the first that considered environmental issues on a global level
1975	The *Belgrade Charter*. Yugoslavia	The *Charter* emphasised a need for a new global ethic that considered 'natural, man-made, ecological, political, economic, technological, social, legislative, cultural and aesthetic" (UNESCO, 1975, p. 10)
1977	The *Tbilisi Declaration.* The Soviet Union	The world's first intergovernmental conference (UNESCO, 1977). This declaration was significant as it created guidelines for environmental education at global, national, and local scales, emphasising the need for holistic and integrated education.
1988	United Nations. Switzerland	The United Nations launched the Intergovernmental Panel on Climate Change (IPCC, 2022b)
1989	Ministerial Conference on Atmospheric Pollution and Climate Change. Netherlands	The first major political conference with representatives from 68 countries. Canada, Australia, and New Zealand joined most European countries to call for the establishment of quantitative limitations on the levels of greenhouse gas emissions. This was opposed by the United States, the United Kingdom, the Soviet Union, and Japan (Bodansky, 2001).
1992	The United Nations Earth Summit. *Agenda 21*. Brazil	178 countries attended the Earth Summit in Rio de Janeiro. Political momentum was gained, and it was the first time countries collectively voiced connections between the economy, international development, and climate concerns. A voluntary action plan, *Agenda 21*, was developed. (Palmer, 2002)
1997	The *Kyoto Protocol.* Japan	The most influential climate action to date with representatives from 192 countries. The legally binding *Protocol* strengthened the global response by committing 37 industrialised countries to a 5% reduction of greenhouse gas emissions below 1990 levels by 2012 (Hopkins et al., 2015b; UNFCCC, 2022).
2012	The *Doha Amendment.* Qatar	The Doha Amendment followed on from the *Kyoto Protocol* and initiated a second commitment period, from industrialised nations to reduce emissions from 2013 to 2020.
2015	The Paris Agreement. France	The United Nations Framework Convention on Climate Change (UNFCC) declared targets to strengthen the international response to climate

		change. The goal was to prevent a global temperature rise of more than 2 degrees Celsius above pre-industrial levels. The United States withdrew from this agreement (Perkins et al., 2018).
2019	UN Carbon Action Summit. America	With the title "A Race We Can Win" United Nations Secretary, General Antõnia Guterres called on leaders to attend with realistic plans outlining how they will reduce greenhouse gas emissions by 45% over the next decade targeting net zero emissions by 2050 (United Nations, n.d-a).
2021	UN Climate Change Conference UK 2021. United Kingdom	The Conference of Parties (COP26) reportedly involved intense negotiations between representatives of nearly 200 countries with, again, the aim to reduce global carbon and methane emissions in an attempt to keep the rise in global temperature to 1.5 degrees Celsius above pre-industrial levels (COP26, 2021).

Five decades of conferences have discussed climate change indicating an awareness of the need for climate action, but the outcomes point to a lack of commitment as well as minimal impact. The political emphasis has been on domestic public pressure rather than international sanctions (Hayward, 2021). The agreements have been characterised by loopholes, compromise, and voluntary targets. As Joy (2021) asserts, for example, critics of the *Kyoto Protocol* argued it failed to make a significant difference in greenhouse gas emissions because of its flawed design (Rosen, 2015). The design focused on short-term and low-impact targets rather than long-term fundamental changes to policies and investments - nullifying a key opportunity. The *Kyoto Protocol's* failure to reduce or stabilise carbon emissions has instead borne witness to their dramatic increase.

The 2021 Glasgow Climate Change Conference (COP26) again, had the opportunity to engender significant global commitment to greenhouse gas reductions. Commentators of COP26 suggested that while the intense negotiations made some progress, for example with a commitment to phase out coal, it was not enough to counteract the climbing global emissions (Mountford et al., 2021). The emissions reduction plans submitted by the 151 countries continue to track toward global warming of 2.5 degrees Celsius by the end of the century - a figure that is considered catastrophic for sustaining planetary health. Furthermore, major emitters like China, the Soviet Union, Saudi Arabia, and Brazil, failed to offer credible pathways toward achieving their proposed net-zero carbon emissions (Mountford et al., 2021).

The COP26 conference that was touted as our last, best chance, was characterised by more 'blah, blah, blah' according to youth activist Greta Thunberg (Paterson, 2021) She is believed to have typified youth voices regarding the anxiety, anger, and frustration over lack of meaningful global action to reduce greenhouse gas emissions. While youth activist movements are intensifying the call for climate action (see Section 2.7), the 2021 Glasgow conference again moved the benchmark, suggesting that emission reduction targets be refined, strengthened, and resubmitted by the end of 2022.

Despite 50 years of conferences designed to address anthropogenic environmental devastation, the rate at which devastation continues to occur is alarming. Since the first Earth Summit in 1972 biodiversity has plummeted with wildlife populations diminished by 58% and one million species currently threatened with extinction, (IPBES, 2019; McElwee et al., 2020). The surface of the ocean is acidifying 50 times faster than any time in history and the volume of arctic ice has reduced by 65% (Armstrong, 2018). Ten million hectares of forest are cut annually (Ritchie & Roser, 2021), and the past decade has witnessed the hottest years on record (Ripple et al., 2019) with fossil fuel consumption, which dipped during the COVID 19 pre-pandemic, predicted to return and exceed pandemic consumption levels (Smith et al., 2021).

The tool of litigation aimed at policymakers and their reluctance to address climate change is fostering a legal basis for climate action, however the adoption of new legislation continues at a sluggish pace (Nachmany & Setzer, 2018). Seeds of change are slowly emerging, as evidenced by Aotearoa New Zealand declaring a climate emergency and introducing a Zero-Carbon Amendment Act. However, global climate action continues to be overwhelmingly inadequate.

2.3.1.1 Comparison of climate change response and COVID 19 response

While climate action continues to lag, the global response to COVID 19 showed the varying responses from governing bodies to enact sanctions that maintain personal and economic security (Pelling et al., 2022). This response revealed that when threatened by severe risk governments have the ability to rapidly alter systemic practices and influence the behaviour of individuals (Hochachka, 2020). There are many parallels between COVID 19 and climate change. Both have no geological boundaries and threaten unprecedented negative consequences to human life and livelihoods. As with climate change, the pandemic has impacted food security, health, well-being, and transport systems and reveals the fragility of a globalised society (Zang et al., 2021). Because of the inequitable distribution of resources and financial disparities, both COVID 19 and climate change have more devastating impacts on

low socio-economic and vulnerable communities. For a successful response, both require coordinated and comprehensive governmental action that promotes citizen buy-in to shift individual and societal behaviours (Zang et al., 2021).

The dramatic and unprecedented global response to COVID 19 was prompted by a sense of urgency over the likelihood of mass illness, overwhelming the health infrastructure, and fatalities. While climate change has the potential to be far more devastating than COVID 19, its insidious nature and complexities have permitted precious decades of inaction. Researchers are now exploring how the response to COVID 19 may provide insight into the mobilisation of global climate action (Botzen et al., 2021). As with COVID19, the response to climate action has varied from country to country according to the perceived threat and political will. Aotearoa New Zealand's response to COVID 19 has been called 'highly successful' in regards to constraining the impact of the virus (Cumming, 2021). This is in stark contrast to historic governmental responses to climate action.

2.3.2 **National response to climate change**

Until 2019, Aotearoa New Zealand's governmental response to climate change had been slow. The Labour government, currently the governing party, has recently stated that climate change is the "greatest challenge facing the world" (Labour, n.d.). Aotearoa New Zealand has prided itself on the image that promoted a clean and green environment (Hopkins et al., 2015a). Despite our pride in this image, Aotearoa New Zealand actually showed an apathetic response to reducing greenhouse gas emissions, until the passing of the Climate Change Response (Zero Carbon) Amendment Act 2019 (Ministry for the Environment, 2021a). For example, carbon emissions in Aotearoa New Zealand increased by 25.7% from 1990 to 2006 compared to the European Union's emissions that reduced by 2.2%. (Carter, 2019b). This placed Aotearoa New Zealand as the fifth-worst performing country out of the 192 countries that signed up for the 1997 Kyoto Protocol. In 2013 Aotearoa New Zealand withdrew from the Kyoto Protocol but accepted the Doha Amendment in 2015 (Ministry for the Environment, 2018). However, our largest emissions contributor, the agricultural sector, which emits 47% of Aotearoa New Zealand's greenhouse gases, was excluded from the 2015 New Zealand Emissions Trading Scheme review (Moir, 2015). It appeared Aotearoa New Zealand would only commit to greenhouse gas emissions reduction climate action so long as it did not disrupt 'business as usual'.

Aotearoa New Zealand's primary mitigation tools had been the 2008 Emissions Trading Scheme (ETS), the Voluntary Carbon Market (VCM), and the goal to plant one billion trees by

2028. These tools have been criticised for failing to provide incentives that encourage the reduction of high carbon-emitting practices (Watts, 2019). Aotearoa New Zealand's climate change response stepped up in May 2018 when the government formed the interim Climate Change Committee (ICCC). The committee was tasked with providing independent evidence and analysis toward transitioning to 100% renewable energy by 2035 and mitigating agricultural methane and nitrous oxide emissions (Interim Climate Change Committee, 2019). This was the first independent government organisation tasked with the role of establishing climate targets. As a result, the unilaterally supported Zero Carbon Amendment Act was passed in November 2019, establishing clear and stable climate change policies for the next 30 years (Ministry for the Environment, 2021a). Characterised as landmark action on climate change, the plan outlined a net-zero emissions target by 2050. This aligned with Aotearoa New Zealand's commitment to the 2015 Paris Agreement, which required each country to develop a plan and regularly report on their contribution to reducing greenhouse gas emissions (Patterson, 2019). The Zero Carbon Amendment Act endeavoured to drive home a national awareness of the need for urgent action. Simultaneously, the Act attempted to appease the agricultural sector by creating a 'two baskets' option where methane emissions from animals would be treated differently from fossil fuel emissions of carbon dioxide and nitrous oxide (Skamp et al., 2021).

While the Act was generally welcomed, it was also criticised for not going far enough and for lack of detail around enforcement and the consequences for failure to meet the targets (Amnesty International, 2019; Young, 2019). Climate Change Iwi Leaders Group chair Mike Smith, as a representative of the indigenous Māori people of Aotearoa New Zealand, agreed the act was aspirational but also considered it lacked specifics on how it would be enforced (Dunlop, 2019). Smith criticised the process, suggesting that Māroi are more likely to be impacted by climate change and therefore should determine climate change policy, not just be part of the consultation process. Nonetheless, the Act has mandated a governmentally led and legal obligation to address climate change and supports the establishment of the Climate Change Commission. This action reflects the most significant Aotearoa New Zealand government commitment to take action on climate change and reduce greenhouse gas emissions.

At the 2021 Climate Change Conference in Glasgow, the Honourable James Shaw, Aotearoa New Zealand's Minister for Climate Change, outlined further actions the government has taken to reduce climate emissions. These included passing legislation that requires companies to report their climate-related risks to shareholders, supporting the purchase of low emission

vehicles, and quadrupling the amount of investment finance available for low carbon technologies (Shaw, 2021). Shaw acknowledged these actions are nowhere near close to being enough and identified that the tasks for the next 15 years would include the fostering of just transitioning strategies. For example, supporting vulnerable regions, groups and affected workers as they transition away from carbon intensive activities towards nature-based solutions and provide a focus on the rights and roles of indigenous peoples (Ministry for the Environment, 2021c),.

However, what appears to be missing in the climate change dialogue, both internationally and nationally, is the opportunity education provides as a strategy to improve understanding of the challenges that climate change will bring, with the view that improved understanding might lead to greater efficacy with adaptation and mitigation strategies. In a submission to the Climate Change Commission, comprehensive climate change education was identified as key to enabling the type of societal transformation that climate change necessitates (Everth et al., 2021). The paper argued for the establishment of a National Climate Change Education Council to act as a conduit between the development of policy, technology, science, and educational facilities. The Council would foster and enhance educational capacity as well as relevant training and up-to-date resources to achieve the long-term transformational outcomes climate change demands (Everth et al., 2021; Gardner-McTaggart, 2020; Kwauk, 2020). The recently introduced Emissions Reduction Plan and National Adaptation Plan acknowledges the need for educational reform to develop necessary skills (Ministry for the Environment, 2022a) but lacks detail on *how* education might best be utilised. A co-ordinated national response would support localised and iwi-based (regional Māori tribe-based) engagement and action. To date a localised response to climate change has been disparate and ineffective (Archie et al., 2018).

2.3.3 **Localised response**

An effective localised response to climate change requires mitigation strategies that are coordinated and addressed at both national and localised levels (Harker et al., 2017). The three key drivers in Aotearoa New Zealand are central government, local government, and iwi/Māori (Lawrence et al., 2015). Regional impacts of climate change require programmes and solutions that are tailored for the region. However, localised, governmental action has historically been undermined by an absence of public pressure and a lack of priority to mitigate and adapt to the impacts of climate change, possibly due to a lack of education, climate and personal risk awareness (Archie et al., 2018; Harker et al., 2017). This has left a vacuum of policy for local government and reduced capacity for direct and localised mitigation policies.

Aotearoa New Zealand is a geologically diverse and multicultural country. Building resilience through mitigation and adaptation policies will vary from region to region. Local Government New Zealand (LGNZ), an umbrella organisation, states on their website, that priority and support is given to the development and implementation of an ambitious low-carbon plan to safeguard resilience within communities (LGNZ, n.d.). The aspirational but non-binding 2017 Climate Change Declaration, presented to local councils by LGNZ, was not unilaterally welcomed. For example, seven councils rejected the declaration criticising it as short, vague, and with no specific targets. The West Coast Council suggested there was a lack of evidence for climate change and expressed concern that the declaration would cost jobs (MacManus & Daly, 2019). More supportive councils, such as the four Northland councils of Tai Tokerau, acknowledged the role they will play in adaptation responses to climate change (Far North District Council, 2019). Te Tai Tokerau climate adaptation strategy acknowledge that adaptation processes run by local government can be fragmented and while the journey has begun, more resources are required to build capacity and capability with communities, for tangata whenua (Māori people of the land) and the workforce (Northland Regional Council, 2022). It is not surprising that Aotearoa New Zealand's localised response to building climate change resilience has been criticised by the IPCC as lacking proactive measures (Carter, 2019a).

Increased resilience entails identifying predictable impacts of climate change, minimising the threats, and, where possible, maximising potential opportunities. Risks and opportunities are linked to management, natural hazards, and sustainable development. Many adaptation strategies will dramatically impact ecosystems and people's lives; therefore, it is understandable that local councils will experience resistance if the general population does not fully understand the importance of such measures (Archie et al., 2018). This is where education is so vital. Effective education and connecting the need for global, national, and local responses to climate action engender greater support for less favourable localised adaptation strategies (Lawrence et al., 2015), which will in turn drive political action. Formal education is a powerful yet unexploited tool (Anderson, 2012; Bolstad, 2020a; Li & Monroe, 2019; Verlie, 2022) that has far-reaching implications to promote understanding of localised climate action in a globalised context.

2.4 Climate change education

Climate change education developed from the grassroots of environmental education with the first connection between the quality of education and environmental health occurring over a century ago by Sir Patrick Geddes (1854-1933) (Palmer, 2002). However, it was not until 1965,

at a conference at Keel University in Staffordshire that the term, environmental education, was considered to have been officially applied. A decade later significant progress was made with the 1975 *Belgrade Charter* that provided a global framework for environmental education, stating;

> To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions to current problems, and the prevention of new ones (UNESCO, 1975, p. 3).

Importantly, this statement raised awareness that individual and collective sustainable environmental action could be achieved through education. Ethical obligations of the educational sector's influence on future and vulnerable populations emerged with the 1977 *Tbilisi Declaration.* Inequitable distribution and consumption of the world's resources added a moral imperative to the social, environmental, and economic dimensions of environmental education. The document identified education as a lifelong and ethical pursuit (UNESCO, 1977).

The *Tbilisi Declaration* highlighted the value of effective environmental education to address environmental challenges as well as radically implying that environmental education might contribute to positive changes within the education system. The concept of societal transformation through environmental education was reiterated in *Our Common Future,* a 1987 publication that included a core message, which promoted the important role education plays in shifting societal behaviours, not only for environmental issues but for the general sustainability of communities (World Commission on Environment and Development, 1987). According to this report, the previous decade had seen a retreat in social and environmental concerns. To counter this, the authors argued for a change in terminology because environment and development could not be separated, stating "The environment is where we all live and 'development' is what we all do" (World Commission on Environment and Development, 1987, p. 7). Environmentalists realised that full participation from all sectors of society was required *if* meaningful change was to occur (Jucker, 2015). The concept of education for sustainability and education for sustainable development evolved and was considered to better represent globalisation and the integration and reconciliation of environmental conservation with economic development. (UNESCO, 2021).

However, the term ‘sustainable development’, was considered controversial and one that diluted the ecological basis of environmental education (Jickling & Wals, 2008). Brown (2015) went so far as to suggest the term was an oxymoron, questioning how an emphasis on *development* in a neoliberalist regime could be reconciled with finite resources and true environmental sustainability. This concern was highlighted at the 2002 summit in Johannesburg, when the United Nations Decade of Education for Sustainable Development report contained no reference to ‘environment’, ‘environmental’, ‘ecology’, or ‘ecological’, other than in the preamble (Jickling & Wals, 2008)

A decade of education for sustainable development from 2005 to 2014, was declared by the United Nations, showing anthropocentric myopia by stating “climate change presents the single biggest threat to development” (United Nations, 2016, p. 36). The decade-long emphasis on sustainable development did not translate into widespread educational practice. Governments remained reluctant to legislate for schools to include environmental and sustainability education and allowed the implementation within formal education to remain optional.

Accordingly, educational institutions lacked commitment, often delivering environmental education obliquely as part of other subjects such as rural studies, outdoor education, conservation, and urban studies (Tilbury, 1995). There continued to be a lack of discourse and engagement with most educational practitioners who were reluctant to explore beyond their own expertise (Jucker, 2015). Ironically, while the United Nations highlighted the importance of social justice to address inequities and safeguard vulnerable communities, the emphasis remained anthropocentrically focused and stopped short of considering the ethical obligations that homo-sapiens may have towards non-human species (Heffron, 2022). The implication was that non-human species were only considered with reference to their usefulness as a resource.

The interesting paradox outlined here, and identified by Palmer (2002) two decades ago, is that while rhetoric has highlighted the importance of environmental education and the need to live in sustainable ways, little priority has been given to formal and holistic environmental education. The increasingly critical time frame for climate action has focused on understanding the relationships between environmental concerns, planetary health, biodiversity, and social justice (Santone, 2018) - leading to a recognition that environmental education may better support transitions towards a more climate-resilient future.

Climate change is the most pressing concern facing all species and ecosystems on Earth and therefore the focus of this research was on the notion, *climate change education*, defined as understanding environmental processes and the need for social justice that leads to climate

action that raises awareness of and addresses environmental challenges (Nairn, 2019; Reid, 2019). Increasingly, educators and researchers support a move away from simpler forms of environmental information transmission toward pedagogies that consider interconnectivity, social complexities, and societal transformations (Hickman, 2020; Kwauk, 2020). Central to climate change education is engagement and an understanding of how to *address* the impacts of climate change at both global and local scales (Bolstad, 2020b; Everth et al., 2021). The emphasis thus shifts from rhetoric to action. It is *action-based*.

Bolstad (2021a), a senior researcher for the New Zealand Council for Educational Research suggested that action can be fostered by empowering individuals with knowledge, skills, attitudes, and values, thus helping society transition to a socially just, zero-carbon future. Although the transformative potential of environmental education has been historically recognised, researchers and educators are now recognising that we must consider approaches that specifically address the social and complex challenges of climate change and that these approaches may differ from previous environmental education pedagogies (Hickman, 2020; Li & Monroe, 2019; Verlie, 2017) (see Chapter 2.10). The formal role of climate change education, with an emphasis on mitigation and adaptation, is recognised as both ethical and cost-effective climate action (Leicht et al., 2018; Mochizuki & Bryan, 2015) as well as potentially fostering behaviour change (Eames et al., 2021). Despite these new understandings, globally and in Aotearoa New Zealand, climate change education remains under-resourced and underutilised (Kwauk, 2020; Verlie et al., 2020).

In order to consider why this might be, the following section outlines the history of education in Aotearoa New Zealand, leading to the current situation with climate change education.

2.4.1 **Aotearoa New Zealand pathway to Climate Change Education**

Aotearoa New Zealand's colonial history, geographic isolation, and the Treaty of Waitangi's (Te Tiriti o Waitangi) principles of partnership, participation, and self-determination (Ministry of Education, 2015c; Smith, 2020) provide unique challenges as well as opportunities for national climate change and climate change education. Despite its bi-cultural founding and constitutional documents for environmental education, like many other Western countries, Aotearoa New Zealand has followed a European pathway, typically delivering environmental education through science, social sciences, and outdoor education (Palmer, 2002).

Aotearoa New Zealand, once colonised by Europeans, developed a compulsory education mandate, which was heavily influenced by the British education system. Aotearoa New Zealand's constitution is based on the 1840 founding document, Te Tiriti o Waitangi (Treaty

of Waitangi), which was signed between the British crown and indigenous Māori, Tangata Whenua (people of the land). This historic document anchored the bicultural status of Aotearoa New Zealand and presented the opportunity for a robust and innovative bi-cultural framework that might have informed twenty-first century educational challenges if Te Tiriti o Waitangi had been honoured and matauranga Māori (Māori knowledge) been included (Te Heuheu Tukino & Orange, 2017). Increasingly, there is an acknowledgement of the importance of bi-cultural understanding as seen with the Education and Training Act 2020: Te Tiriti o Waitangi (Ministry of Education, 2022a), that aims to give all learners a culturally responsive and inclusive education.

Tāngata whenua (Indigenous Māori people of Aotearoa New Zealand) consider climate change and biodiversity loss to be an urgent concern (He Pou a Rangi Climate Change Commission, 2021b). The importance of maintaining balance within the environment has been intrinsically understood by Te Ao Māori (Māori worldviews). Department of Conservation ecologist, Dion Pou (2021), asserts that Mātauranga Māori (Māori body of knowledge) considers that fundamentally, everything is interconnected. Te Ao Māori's central construct is the *holistic* relationships humans have between past and future generations, the sea, and the land (McMeeking et al., 2019). Traditionally Tikanga Māori (customs and traditional values), spirituality, purpose, and identity were interwoven through social *and* environmental practice (Kawharu, 2000). Tikanga Māori can be clearly understood through concepts such as kaitiakitanga (intergenerational guardianship), manaakitanga (care and reciprocity), whakapapa (genealogy), and whanaungatanga (connectedness and relationships) - all of which contribute to a cultural framework and innate understanding that humans are entangled with non-human species across time frames and planetary systems (Pou, 2021; Smith, 2020).

Historically however, the combination of colonisation, with a governmental strategy of assimilation and a Eurocentric education policy have negatively impacted the educational opportunities and outcomes for Māori – for generations (Ka'ai-Mahuta, 2011; Santamaría et al., 2015). Adapting to climate challenges requires culturally responsive and inclusive mitigation and adaptation strategies that sit beside Western science and become embedded into the climate action dialogue (Berryman & Eley, 2018; Nuñez, 2018; Smith, 2003). As respect grows for the oral histories, environmental wisdom, and sustainable practices of indigenous cultures, so has the recognition that the climate crisis cannot be addressed using the same Western industrialised practices that helped to create the problem (Orr, 1992).

Environmental education in Aotearoa New Zealand supported, in principle, the 1992 Earth Summit's *Agenda 21*, obligating the government to develop Environmental Education policies

and curriculum (Eames et al., 2008). The positive intent was undermined by the non-compulsory nature of environmental education policies which meant responsibility for environmental education remained with the individual school's Board of Trustees (the school's elected governance body). Consequently, depth of instruction varied and depended on the interest and motivation of individual teachers to deliver programmes based on the knowledge they had. Inclusion of environmental education within a school environment tended to be driven by enthusiastic teachers, in some cases with support from community groups, local government, and non-government organisations (Bolstad et al., 2015).

A step toward greater inclusion of environmental education occurred when sustainability ideas were added to the national curriculum in 1993 (Eames & Barker, 2011), and guiding principles were developed by the Ministry of Education in 1999 that led to the production of *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 2015a). The foreword stated that Environmental Education is an investment in our future and highlighted the ongoing need to develop a national strategy in schools. These *Guidelines* offered a framework that would link learning experiences throughout the school in a coherent way and supported teachers who planned to include environmental education components within their current curriculum planning but did not add to the curriculum requirements of teachers or schools, who already felt overburdened. The *Guidelines* were seen as a tool to help teachers identify opportunities within the existing curriculum statements (Ministry of Education, 2015a) and reflected a willingness to support environmental education with an emphasis on planning to provide education 'about', 'for', and 'within' the environment. However, the extent they were to be incorporated within a school would still be determined by the individual school's Board of Trustees and were likely to reflect the local community's values and interests.

The *Guidelines* resulted in an upsurge of environmental education activity (Eames & Barker, 2011), reflecting a holistic vision derived from the *Tbilisi Declaration* (Chapman, 2011). The stated aims were for students to develop:

- Awareness and sensitivity to the environment,
- Knowledge and understanding of the environment,
- Attitudes and values towards the environment,
- Skills in identifying and solving environmental problems,
- A sense of responsibility through participation and action (Ministry of Education, 2015a),

Most significantly, these guidelines recognised Māori world views, as represented through Tikanga (principles, values, and spirituality), and acknowledged how from this perspective, people and the natural environment interacted and were interdependent. The *Guidelines* were accompanied by the rolling out of a professional development programme to foster Environmental Education in schools (Ministry of Education, 2015a). Once again, the non-compulsory status gave mixed messages about the priority Environmental Education should have within education (Eames et al., 2008). The *Guidelines*, argued Chapman (2011), gave the appearance of meeting the obligations of the *Tbilisi Declaration* without seriously interrupting the educational agenda of the time, which focused more on economic prosperity than sustainability issues.

A revised *New Zealand Curriculum* in 2007 recognised the value of, and supported a, pedagogical shift toward student-centred learning (Ministry of Education, 2007b; Service & Thornton, 2019). The revised *Curriculum* advocated for schools to incorporate values into their teaching, such as ecological sustainability, community and participation, principles of equity, as well as using cross-curriculum issues, such as sustainability, and globalisation (Ministry of Education, 2012). The educational objectives were again influenced by *Agenda 21,* along with the enduring, forward-thinking environmental education objectives of the *Belgrade Charter.* Below, connections are made between the *Curriculum's* five key competencies and the *Belgrade Charter's* objectives (in italics).

1. Thinking *(awareness)*

2. Using language and symbols *(knowledge and skills)*

3. Managing self *(attitude)*

4. Relating to others *(awareness)*

5. Participation and contributing *(participation and skills)*

The intent of the key competencies was to provide flexibility and autonomy for schools to work with the individual character of their local communities, and they each align comfortably with the aims of environmental education. However, messages around environmental engagement remained vague, with schools largely guided by leadership, and the Board of Trustees leading to voluntary and inconsistent implementation of environmental education (Ministry of Education, 2015a). Practical applications of environmental sustainability did not develop strongly within schools, with environmental programmes largely left to localised, externally

driven programmes run by environmental initiatives, which were largely dependent on outside sponsorship. For example, programmes were established such as, Kids Restore the Kepler, Experiencing Marine Reserves, Whitebait Connection, Project Island Song's Floating Classrooms, Eco Solutions, and Greening Taupo, many of which incorporate a Collaborative Community Education Model (Eames & DePetris, 2018) and have provided outreach environmental education for schools. An enduring programme that has prominence in both primary and secondary schools is the Enviroschools programme (Williams, 2012).

The Enviroschools programme, launched in 2001, offered schools an environmental action-based programme designed to empower locally based, sustainable projects in the school environment and neighbourhood. The whole-school Action Competence-based approach empowered learners by unifying key educational concepts, in a democratic way (Eames & Barker, 2011). Enviroschools facilitators worked with teachers to guide students in the planning, design, and implementation of local sustainability projects, encouraging reflection and adapting accordingly. Long-term commitment to execute the iterative and cyclical journey, best suited to environmental education were encouraged. Additionally, Enviroschools acknowledged Te Tiriti o Waitangi (the Treaty of Waitangi) and supported Tikanga Māori (Māori principles, values, and spirituality), encouraging concepts such as whanaungatanga (interconnectedness and relationships) and kaitiakitanga (intergenerational guardianship) (Zink, 2020). The Enviroschools website cited an involvement from 43% of primary and intermediate schools and 33% of secondary schools in Aotearoa New Zealand (Enviroschools, 2018). Enviroschools (English medium) and Te Aho Tū Roa (Māori medium) while not embedded in the everyday running of the school curriculum, have provided an example of an effective environmental education programme that has offered a local, place-based, project-based, culturally appropriate environmental learning.

Despite the uptake of Enviroschools, a 2015 Research Update (Bolstad et al., 2015) into environmental education in Aotearoa New Zealand schools found they continued to receive mixed signals about the priority of environmental education, leading to ongoing inconsistencies. More encouraging was a recent report that identified 78% of primary and intermediate schools identified kaitiakitanga (intergenerational guardianship) as either partially or fully embedded within the school (Bolstad et al., 2015). Secondary schools that showed an environmental focus were far less common (Bolstad (2020a).

A particular challenge for Aotearoa New Zealand is the tension that environmental education presents to the status quo. It is politically confronting to ideologies focused on aiding economic prosperity, globalisation, and neoliberal ideology (free-market capitalism) (Chapman, 2011).

According to Chapman, this is the reason that environmental education has continued to sit awkwardly in the background of educational documentation and policy. Unsurprisingly, the Ministry of Education (2018) reported a fall in students' awareness of environmental issues between 2006 and 2015, as shown through data from the Programme of International Assessment (PISA).

In an attempt to address the decline in environmental awareness, The Department of Conservation, The Ministry of the Environment, and the Ministry of Education formulated, the *Mātauranga Whakauka Taiao Environmental Education for Sustainability Mahere Rautaki Strategy and Action plan 2017-2021* (Department of Conservation, 2017). The purpose of this multi-party document was to refresh "the Government's approach across agencies to ensure we equip our young people with the understanding, skills, and motivation they need to help address New Zealand's many environmental challenges" (p.1). The *Strategy and Action Plan* reiterated education's critical role to strengthen the positive influence individuals and communities may have on the environment and society. The *Strategy's* five guiding principles echoed the philosophies of previous environmental plans: growing knowledge, skills, and understanding, sharing values, taking collective action, thinking about the future, and adopting a uniquely Aotearoa New Zealand perspective.

Significantly, "adopting a uniquely Aotearoa New Zealand perspective" (Department of Conservation, 2017, p. 8) indicated a departure from simply following global environmental educational trends to recognising the unique cultural and environmental needs of Aotearoa New Zealand and the country's obligation to Te Tiriti o Waitangi (Treaty of Waitangi). Respecting the bi-cultural nature of Aotearoa New Zealand and facilitating solutions inspired by the experiences and wisdom of Māori and indigenous cultures provided an exceptional opportunity for mitigating and adapting to climate change (Sena, 2021; Smith, 2020; Whaanga et al., 2018).

Including the core Te Tiriti of Waitangi principles of partnership, participation, and self-determination in climate change education provides an opportunity for more meaningful dialogue and action by acknowledging the importance of indigenous knowledge and potentially engaging people who might be more vulnerable to climate change. Aotearoa New Zealand's bi-cultural history offers a unique and favourable environment for combining Western and indigenous understanding of climate change challenges and subsequent action.

However, progression towards integrated environmental and climate change education programmes is slow. An integrated approach within secondary schools remains uncommon and

schools that encourage inquiry into Mātauranga Māori (Māori knowledge) and other indigenous knowledge as a potential resource base for understanding sustainability and climate action are rare (Bolstad, 2020a). The recent release of the Ministry of Education (2021b) social sciences *New Zealand Curriculum Refresh* (in draft) indicates the expectation that teaching should represent the "imagining of equal, balanced relationships between Māori and other New Zealanders" (p18), and "drawing on a wide range of sources (with particular attention to Mātauranga Māori), considering biases, and identifying missing voices" (p.12). The document identifies the need for educators to encourage a stronger sense of environmental responsibility, an expectation that students will know the urgency created by climate change. As outlined in this section, however, many previous well-intentioned documents with similar directions have failed to influence the implementation of secondary school environmental or climate change education in any practical or meaningful way.

Research informed climate change education is slow to be reflected in English medium secondary schools. Most retain predominantly siloed curriculums and timetables, offer Western science-based descriptions of climate change that focus on the causes, impacts, and individual actions (Bolstad, 2020a; Kwauk, 2020; Verlie & Flynn, 2022). Education that offers deeper systemic consideration, such as transitioning to a 'green' economy or career pathways towards climate-friendly professions are unlikely to be addressed (Bolstad, 2021b), suggesting that educators rarely aim to empower systemic and collective climate action. Most disturbing is that, despite the outpouring of climate change alarm expressed by students in the 2019 climate strikes, and the escalating global awareness for the need for climate action, when climate change education is discussed at Aotearoa New Zealand educational conferences and forums, it is done so with a depressive tone that encourages facilitators to swiftly move on (Bolstad, 2021a). This highlights the feelings of discomfort around climate change and the challenges associated with increasing educator confidence if we are to address similar feelings of discomfort in youth.

At the heart of the issue in Aotearoa New Zealand, is the ongoing emphasis on voluntary programmes, and minimum guidance provided by the Ministry of Education - despite the extraordinary platform provided by the 2019 climate strikes. Such examples of student voice present the education sector with authentic contexts to use, integrate and discuss the impact of climate change education, political literacy, and indigenous knowledge for application in current educational practice. Despite such opportunities, there appear to be significant barriers to progress.

2.5 Barriers to climate change education

The barriers to climate change education mirror the barriers to climate change action. The purpose of this section is to consider structural and psychological barriers associated with climate action, and to then explore the systemic and classroom barriers facing climate change education.

Governmental and individual reluctance to take action on climate change are characterised by denial at all levels and a perceived need to protect the status quo (Rapley, 2013). Capacity to respond to the uncomfortable truth of the potential consequences of climate change is minimal. The 'dragons of inaction' (Gifford, 2011, p. 1) include psychological barriers that impede behaviour change and structural barriers that constrain adaptation and mitigation strategies.

2.5.1 Psychological barriers

Psychological barriers inhibit individual engagement and impede behavioural choices that would facilitate mitigation and adaptation (Gifford, 2011). Behavioural science has identified that one of the challenges for climate action is that many individuals perceive climate change will not happen in their lifetime (Shea et al., 2016). In essence, for many it is a distant and non-urgent issue with limited spatial, temporal, and social relevance (Hopkins et al., 2015b; van der Linden et al., 2015). While many do acknowledge the importance of climate change, 50 per cent of those felt hopeless about the issue and were unsure exactly how to personally address action. (Bieniek-Tobasco et al., 2019). A sense of hopelessness was further exacerbated by a general lack of knowledge about potential solutions.

Climate change has historically been considered politically charged, and by association, controversial. Climate action involves managing a range of conflicting interests and values (Perkins et al., 2018). Individuals accessing increased data or information do not necessarily change behaviours as 'confirmation bias', a cognitive process that encompasses a preference for information that confirms previous beliefs, ensures individuals seek to reinforce established opinions (Kunkle & Monroe, 2018). Even more limiting is the notion of reactance, which is defined here as an oppositional response to perceived pressure if it is believed that the message will threaten personal freedom and one's current way of life (Ma et al., 2019). The dystopian future that is often forecasted might exacerbate reactance and instead of energising climate action, as intended, may reduce motivation (Haslett et al., 2011; Stevenson et al., 2014). The varied and complex psychological barriers associated with climate change are potentially time-consuming and difficult to change. So too are the structural barriers that impede mitigation and adaptation strategies.

2.5.2 **Structural barriers**

Structural barriers include infrastructure, community, economic, and political challenges. Significant infrastructural changes are associated with substantial expense and long-term projects (Labour, n.d.). The governing political party or coalition has a three-year term in Aotearoa New Zealand. Gaining a further term requires a focus on re-election, requiring time to be spent on placating voters, and ensuring that unilateral and long-term policies are not a priority. Climate change requires longer term political and environmental choices that will impact over decades and centuries, which does not fit with our current political system (Brocklehurst, 2015). Overcoming structural barriers requires unilateral political support, yet controversial and conflicting interests, such as the political party ACT voting against the Zero Carbon Act, and values around climate change continue to stymie political action at national and regional levels.

At a community and industry level, businesses and organisations, including schools, may believe that climate change adaptation is beyond the scope and budget of their core business (IPCC, 2014; Mallon et al., 2013). It is important to consider that, despite a motivation to align with political agenda or imperatives, community businesses and organisations can face inadequate financial resources, lack climate change knowledge, and the skills needed to structurally mitigate and adapt their organisation to climate change (Harker et al., 2017). Ideologies and attitudes of whānau (family) and parent caregivers are transferred to our student population and serve as yet another hurdle to overcome (Lawson et al., 2019). Schools reflect the complex psychological and structural challenges and barriers facing all communities.

2.5.3 **Systemic and classroom barriers**

There are multiple roadblocks before secondary schools can empower climate change action within their communities (Kwauk, 2020). This section discusses the barriers facing climate change education that occur at a systemic level and at a classroom implementation level. These barriers are compounded by general apathy to climate change education that exists at policy and leadership levels (UNESCO 2021).

2.5.3.1 Systemic barriers

A lack of support and limited direction from national policy towards climate change education in Aotearoa New Zealand has thwarted the implementation of climate change education in secondary schools for decades (Bolstad, 2020a). UNESCO's analysis of national curriculum frameworks from 100 countries that found 47% of curriculum frameworks made *little or no* reference to climate change (UNESCO, 2021). The importance of climate change education is

often obscured in secondary education because it is considered complementary to subject content rather than fundamental to students' learning. This is evident in the *New Zealand Curriculum,* which currently offers no specific directions for climate change education (Eames, 2017; Kwauk, 2020).

Students transitioning from primary schools, where they are more likely to have experienced an integrated approach to environmental education, are unlikely to maintain continuity of learning when they enter secondary schools because of the inconsistent focus on climate change (Brignall-Theyer et al., 2010). This is often because the siloed structure of secondary schools, combined with assessment and timetable constraints, impede cross-curricular learning– deemed as best suited to climate change education (Bagoly-Simó, 2013). While school-wide support for engaging in climate change was high, prioritising sustainable practices or providing a focus on climate change education was uncommon in secondary schools Bolstad (2020a). Systemic apathy is compounded by minimal accountability procedures devised to monitor climate change education (Kwauk, 2020; Leichenko & O'Brien, 2020). The current lack of monitoring also conceals schools that are providing best practice climate change education.

Increased interest from the secondary school sector shows an awareness of the need for climate change education, however educators are constrained by the political nature of climate change dialogue, the drive to maintain the status quo plus a sense they lack the knowledge and skills to manage the complexities of the content (Bolstad, 2020). Without radical vision, courage and systemic support, the implementation of climate change education in the classroom will continue to be challenging.

2.5.3.2 Classroom implementation

Along with the voluntary nature of sustainability subjects and resourcing for teachers, classroom implementation is constrained over concerns about inducing increased anxiety among students (Bright & Eames, 2021; Verlie et al., 2020) – particularly during the COVID 19 pandemic.

Firstly, engaging students to choose non-compulsory subjects such as sustainability education means it is only students who are already aware and committed to environmental concerns who are likely to make this choice (Brignall-Theyer et al., 2010). School leadership teams may recognise the need for climate change education and climate action, but are reluctant to jeopardise existing structures, assessments, and policies (Kwauk, 2020),

The second key barrier to the classroom implementation of climate change education is the minimal support offered to teachers. Teachers report feeling under-resourced, time-poor, and overwhelmed when faced with climate change education (Bolstad et al., 2015; Everth et al., 2021; Hickman, 2020; Verlie et al., 2020). The COVID19 pandemic has added to classroom challenges as teachers attempt to reduce the negative impacts of isolation and distanced learning (Bolstad, 2020a; Rincones et al., 2021). The feeling that "schools always add, they never subtract jobs" (Brignall-Theyer et al., 2010, p. 12) is widespread, so the preparation needed for developing the knowledge and skills to teach climate change education can become less prioritised.

In the face of limited resources, climate change education can be viewed as confronting and requires complex ethical consideration, and possibly value transformations, with consequences and solutions that are far-reaching and unpredictable (Ilisko, 2018). UNESCO reported that 95% of educators surveyed from over 100 countries felt teaching about climate change was important, but fewer than 40% felt confident to teach it (UNESCO, 2021). In the United Kingdom, the youth-led campaign *Teach the future*, found that 70% of teachers felt inadequately prepared to teach climate change and motivate climate action (Teach the future, n.d).

The third and increasingly concerning barrier involves the growing awareness of the anxiety caused by climate change. Educators are often hesitant to explore a subject that is considered controversial, highly political and may exacerbate anxiety among their students (Bright & Eames, 2021; Hickman et al., 2021; Kunkle & Monroe, 2018; Verlie et al., 2020)). Further advocating for societal change that might be perceived to adversely affect the economic welfare and lifestyle of the local community is another deterrent and could lead to complaints from parents or caregivers (Plutzer et al., 2016). It is not surprising that teachers are already grappling with teaching the curriculum, find the implementation of climate change education confronting. Only the most committed climate change educators are likely to push through these barriers.

The barriers discussed here exemplify the conundrum facing climate change education. Growing awareness of the climate crisis and the impetus to effect climate change education is often counteracted by barriers that reflect the complex nature of climate action. For example, the idea that greater awareness and action may be perceived to have negative ramifications on classroom dynamics and societal equilibrium. Despite the climate crisis demanding urgent action, addressing the educational barriers is often sidelined to ensure traditional education structures are not disrupted (Campbell-Price & Cosgriff, 2017; Hopkins et al., 2015b; Kwauk,

2020). However, schools have an obligation to ensure the wellbeing of their students and the rising levels of eco-anxiety can no longer be ignored.

2.6 **Youth anxiety**

A growing body of research documents rising levels of ecological distress and climate concerns among youth (Bright & Eames, 2021; Hickman, 2020; Pihkala, 2020; Verlie et al., 2020). For example, a 2021 multi-country survey of 10,000 youth reported that 75% considered their future to be frightening (Berman, 2021).The World Health Organisation estimated that our current youth will endure more than 80% of the injuries, illnesses and deaths expected to be caused by climate change (Sanson & Burke, 2020). Climate anxiety can be considered a disorienting dilemma (Mezirow, 2012), a situation that significantly disrupts an individual's well-being.

Cognitive dissonace is more knowledge based but can equally disrupt equilibrium as awareness is heightened around contradictory knowledge. Originally theorised by Leo Festinger in 1957, he reflected that pairs of cognition (elements of knowledge) could be consonant or dissonant. Contradictory information, such as knowledge of the urgency needed to address climate change when compared to awareness of the complacency to take climate action, can create incongruence (Harmon-Jones & Harmon-Jones, 2019). Psychological tensions and discomfort can emerge when knowledge, beliefs or attitudes are discordant with actions and may disrupt a sense of equilibrium. In an attempt to remove the discomfort and restore equilibrium the person either denies responsibility, trivialises the situation or changes their behaviour (Peters & Filipova, 2009). The action-based model of cognitive dissonance suggests that the discomfort individuals experience has the potential to act as a motivator by encouraging a shift in focus to attempt to restore equilibrium and this may lead to behaviour change.

The disorientation that is caused by a growing awareness of climate change can conflict with an individual's current frame of reference regarding climate action. How risks are framed may aggravate that despair (Hayward et al., 2020). Youth feel ill-equipped to explain this conflict, their experiences or emotional wellbeing (Howie & Bagnall, 2013). Such contexts exacerbate anxiety, anger, frustration, grief, panic, and sorrow. Although researchers have acknowledged that learning about environmental devastation may cause anxiety (e.g., Jensen & Schnack, 2006), until recently the emotional impact has rarely been discussed.

Those who are the least responsible for the causes of climate change, are potentially the greatest victims (Orr, 1992; Winograd, 2016). Recent and heightened recognition of historical injustice with regard to the impacts of climate change have led to greater anxiety among youth. Terms

appearing more frequently in psychology literature include: biospheric concern, eco-guilt, eco-psychology, ecological grief, and solastalgia (a newly coined word that describes existential or emotional distress caused by climate change) (Albrecht, 2020). Psychologically-bounded research into the impact this distress has on mental health is scarce because it is a complex and newly emerging phenomenon (Cianconi et al., 2020). It is thought that data documenting the impact of increasing eco-anxiety might promote the urgency of change required by educators (Verlie, 2022).

2.6.1 **Anxiety impact on education**

Climate change education is an area that is fraught for educators as well as youth (Bolstad, 2021b). Adolescents are generally under-represented in studies regarding climate change concerns even though they are a unique cohort, key to climate change action (Lawson et al., 2019), who will be most impacted (in the short term) by inaction. Research investigating the impact climate anxiety has in educational spaces or how educators should respond to climate anxiety is still in its infancy (Harrē, 2020; Kleres & Wettergren, 2017; Verlie et al., 2020).

Research conducted in Australia found educators were reluctant to address climate change in the classroom because of the rising concern and confusion over eco-anxiety for both teachers and youth (Verlie et al., 2020). Such discomfort and uncertainty can be challenging for educators and as discussed in Section 2.5.3, adds yet another barrier to the implementation of climate change. Educators are reported to be feeling overwhelmed with their own emotions around climate change and are often left feeling daunted and underequipped to teach climate change in the classroom (Hickman, 2020; Verlie et al., 2020). Meanwhile, students can disengage to protect themselves from the disturbing reality of climate change - a behaviour termed ‘strategic denialism’ (Haltinner & Sarathchandra, 2018). In essence, we have a perfect storm gathering around climate change education.

Further educational challenges occur as youth are reported to distrust older generations. Youth are questioning why, despite the evidence, climate action has not been implemented globally or locally earlier, and this has led to feelings of betrayal and grief (Jones & Davison, 2021; Kowalski, 2019; Ojala, 2021). The inaction of adults, combined with the dismissal or patronising of youths’ climate concerns, is what scares youth the most (Hickman, 2020). According to the 20-year-old climate activist Clover Hogan, blinkers have been created, thereby allowing no room for youth to engage with their anxiety. Addressing anxiety, rather than denial or avoidance, is required to progress through and beyond - to a place of action (O'Keeffe, 2021, April 19).

To support such practices however, educators will require new skills, empathy, and understanding, to cater for the intersection of emotional epistemologies - such as understanding how emotions might relate to knowledge development (Pihkala, 2020). Reflecting on epistemological type questions might support educators focus with climate change (Verlie, 2018). The challenge for educators is learning to process and navigate their own emotions as well as developing strategies that enable and empower youth to move beyond eco-anxiety, towards agency and action (Bright & Eames, 2021; Verlie et al., 2020). As overwhelmed and hopeless as youth may report they are feeling, emerging research suggests anxiety may also act as a *catalyst* towards climate action.

2.6.2 **Eco-anxiety as a catalyst to action**

Emotions are motivators, they play an important role in reasoning, they can assist in identifying problems and are often a catalyst for action (Hickman, 2020). Strong emotions are essential to connect the big picture (macro) with the small actions (micro) and to prompt action (Mizen, 2015). Knowledge alone does not necessarily activate changes in behaviour, yet anxiety can work as a powerful decision-making motivator (Kleres & Wettergren, 2017; Li & Monroe, 2019). Hickman (2020) argues that eco-anxiety, is not necessarily a deficit emotion, rather concerns regarding climate change and biodiversity loss can be harnessed to adopt the actions needed for change. Eco-anxiety also reveals a level of eco-empathy, eco-awakening, eco-awareness, and eco-agency; all positive aspects of this environmental dilemma. Dialogue around the power of emotions and the cultivation of emotional awareness with both educators and students is expanding (Ojala, 2021; Pihkala, 2020) with increasing evidence that educators need to recognise, acknowledge, and work with the emotional aspects of sensitive and controversial issues surrounding climate change.

The growing evidence of the educational changes needed for the enactment of climate change also raises awareness of cultural barriers. Educators who practice from a Western paradigm may innately consider that emotions are mostly naturalised or fixed, thus holding an implicit understanding that they have no place in the classroom (Ojala, 2021). There has traditionally been and expectation that classroom teachers ensure student wellbeing by mollifying emotions within the classroom. This, considers Ojala (2021), could be viewed as a political device that disempowers youth and undermines any social criticism - a concept that aligns with Freirean critical theory (Freire, 2015). Discomfort at emotional outbursts may be why many schools felt threatened by Greta Thunberg, the 15-year-old Swedish student who initiated the school strikes and who role modelled her concerns visibly with an outpouring of emotional anger.

According to Verlie (2022), the capacity to *feel* is not yet considered a way of 'knowing' in Western educational paradigms. Further challenges arise when emotional expressions vary between cultures and societies (Barbalet, 1998). Classroom populations may manifest varying emotional responses, some interwoven with power and others, which are culturally informed. Critical awareness of and respect for these emotional responses is necessary in learning situations. Freire argued that from personal experience, such a process can move individuals from despair to what eventually can emerge as hope (Freire, 2015; Nairn, 2019). Climate change educators need to consider a pedagogical framework that supports students to acknowledge their emotional state, face their concerns, critically reflect, learn from the reflections, and transform their anxiety into constructive action (Boler, 1999; Ojala, 2021).

The education sector can be considered, in part, culpable for the rising anxiety of youth due to the lack of consistent and coherent implementation of climate change education to date (Everth & Bright, 2022). Youth are starting to take matters into their own hands, becoming activists, educators and political agitators (Verlie & Flynn 2022)

Despite the challenges, the opportunity now is for educators to accept the moral imperative to address the mounting eco-anxiety, and in the process, prepare current and future generations for a climate-altered future.

2.7 Youth and climate action

The unprecedented numbers of youth participating in the climate strikes is testimony that the youth are engaged in the call for climate action. This section considers the history of youth activism and in particular, how Greta Thunberg inspired a global climate strike movement. The call for heightened political literacy and agency for youth is discussed as well as the need for understanding social justice and indigenous knowledge - in order to propel a just model of climate action.

Aotearoa New Zealand has a rich history of activism with social and environmental movements variously influenced by our historical, cultural, and geographical forces. All inhabitants in Aotearoa New Zealand have a migration history, often represented by their view that they have left *unjust* social circumstances from various places around the globe, to seek a better future of greater equality and improved opportunities (Alakavuklar & Dickson, 2016).

Activism, typically, protests against governmental action or inaction. Where individuals concerned about injustice may feel ineffectual and therefore disempowered, the solidarity offered with a collective activist movement, such as the 2019 climate strikes, may embolden

individuals towards action (Richter, 2011). The year 2019 saw a groundswell of national and global environmental activism, including the school climate strike movement and the more radical Extinction Rebellion movement (Extinction Rebellion, 2019; Global Climate Strike, 2019). Both movements represented dynamic youth activism, protesting what they considered injustices, and in spite of the fact they were often too young to vote, exercising their democratic right to freedom of speech.

2.7.1 **Youth activism**

For decades youth have been active and notable catalysts for change. Because of their age, however, their voice has often been dismissed (Blakemore, 2018). For many youths, participating in politics can be a disempowering experience. In 2012, statistics showed that Aotearoa New Zealand youth, as with English, American, and Australian youth, had declining rates of political and social engagement (Beals & Wood, 2012). Due to social conditioning, there was a view that youth had been politically marginalised and considered themselves as passive social actors, unable to instigate significant social change until adulthood (Gordon, 2010). Paradoxically, there has also previously been an expectation that youth will not be malleable or placid but will be socially and politically involved, yet adults expect to define and regulate the type of agency and involvement occurring (Gordon, 2010). These views have created a complex political terrain for youth, one that requires negotiation through paternalistic structures (Verlie & Flynn, 2022). A challenge for educators is that youth engagement differs to that of adults as youth prefer to be involved in more ad-hoc types of thinking and action that are issue-oriented and personalised (Boulianne, 2020). Despite the difficult terrain, where some youth can be uncertain and lack confidence, others persist because of a motivation to change "history, the thing shaping our lives and hope, the thing making it impossible to stay silent" (Morrow, 2016, p. 2).

A heartening rise in youth activist leaders emerged leading up to 2019 (Amnesty International, 2019), as they claimed their space and tried to drown out the rhetoric of 'strong-men politics'. Youth can be seen to be challenging power and expressing their political agency in diverse ways such as dutiful, disruptive or dangerous dissent (O'Brien et al., 2018). The strike leaders' actions fall between disruptive and dangerous dissent - disruptive dissent critiques, challenges, and aims to modify existing norms while dangerous dissent defies norms and generates a new way of operating. The Harvard Graduate School Magazine claims this groundswell of youth activism is the most forceful surge since the 1960's. Research conducted by Wood et al. (2017), found that in Aotearoa New Zealand, a steady growth occurred in student numbers studying social action for their National Certificate of Educational Achievement (NCEA, New Zealand's

senior secondary examination framework) assessments. The key to enticing students, according to Boulianne (2020), was the choice they had, to focus on issues they considered important and that had the most personal significance to them. The implication has traditionally been that for youth activism to be most effective, there must be adult allies or mentors (Jason, 2018), yet this might be debunked by the youth experiences of the 2019 climate strikes. Indeed, a key strength and engagement factor with the Aotearoa New Zealand climate strike was that they were led *by* youth *for* youth (Bright & Eames, 2020)

The thinking that leads to youth activism is often alternative to or decades ahead of adults' perspectives (Barret, 2018, April 20). As a result, despite a perceived lack of independence within young people, many historically significant social changes have occurred - largely due to youth activists. For example, the American civil rights movement, the American Vietnam war protests, the Chinese Tiananmen Square pro-democracy protest, the Arab Spring pro-democracy movement in the Middle East, the American indigenous water rights protest (Blakemore, 2018), and more recently, the Hong Kong protest and climate change strikes which have all been led by youth. These events have been provoked by a deep disillusionment and belief that governments committed injustices either by their actions or as a result of inaction. Crowther and Shaw suggested social movements have the potential to be transformative as they offer "collective thinking icebergs" (Crowther & Shaw, 1997, p. 226) and move people to evaluate and act against the status quo. This process provides educational potential within social movements.

Politically active youth are frequent users of social media (Cinelli et al., 2021; Valenzuela, 2013). Collective action requires not only social networking but also a shared understanding, connective structures and a potential goal of accomplishment that resonates culturally with the activists to unite a movement (Richter, 2011). Historically, books, pamphlets and literature were used to disseminate protest messages, but contemporary activists have utilised and facilitated collective, global action through social media (Creeber & Martin, 2008). Digital technology has provided an avenue for rapid and efficient connection between activist youth globally (Gordon, 2010), thereby enabling individuals to have more dynamic and efficient communication than previous generations. The climate strikes benefitted from the snowballing communication channels, propelled by the sophisticated and nuanced digital technological skills of strike leaders (Boulianne, 2020).

Social media is not a panacea, however, and for youth activism there is the risk the activism goal will both start and end online with little achieved. Nevertheless, Jason (2018) suggests that social media is considered essential for student activism today. Social media increases

visibility and facilitates a louder, more coordinated action. It has the potential to create a feedback loop that *builds* a movement. Adversely, social media may negatively impact critical thinking, through the formation of like-minded groups that reduce exposure to alternative or diverse perspectives, creating an echo chamber that reinforces a certain narrative (Cinelli et al., 2021). The algorithms that feed social media vary across social media platforms, however, with the climate strike movement, the original and powerful message from Greta Thunberg resonated with youth - allowing digital platforms to be used effectively to build momentum (Marris, 2019).

2.7.2 **Greta Thunberg**

Greta Thunberg has become synonymous with youth climate activism. As a 15-year-old Swedish student, her concern for political inaction with climate change motivated her to strike from school, initiating the 'School Strike for Climate' (also known as Fridays for Future) movement (Murphy, 2021; Watts, 2019). Inspired by the Parkland School students in Florida, who protested the United States gun laws by striking from school, in August 2018 Thunberg committed to sitting quietly outside the Swedish Parliament prior to their Swedish elections, with her hand painted sign that read 'skolstrejk för klimatet' (school strike for climate). Local and social media interest rapidly spread, initiating an unprecedented global youth movement. The climate strikes of 2019 mobilised approximately 10 million people from 260 countries (Verlie & Flynn, 2022) with a sophisticated campaign. The 2019 Time magazine voted Thunberg their Person of the Year (Alter et al., n.d).

The movement's success was credited to the youth-centred and ecopolitical nature of the movement (Murphy, 2021; Sabherwal et al., 2021). Thunberg, who has been diagnosed with Asperger's Syndrome, claims to be less affected by social distractions than other youth may be. She offers stark clarity and is credited with delivering blunt messages calling for radical and immediate societal changes. Her message was amplified by social media, scientists, and support from celebrities and public figures (Jung et al., 2020), reaching across all age groups but resonating more with youth and those who shared similar political ideologies (Sabherwal et al., 2021).

Thunberg attempted to hold previous generations to account for climate inaction, with messages that some considered confrontational. For example, at the 2021 United Nations Climate Summit she said;

> You have stolen my dreams and my childhood with your empty words and yet I'm one of the lucky ones. People are suffering.

> People are dying. Entire ecosystems are collapsing. We are in the beginning of a mass extinction and all you can talk about is money and fairy tales of eternal economic growth. How dare you! (NBC News, 2019)

Thunberg's outrage accentuated the intergenerational and social injustice of climate change as well as directly connecting the climate crisis to neoliberalism and the global fixation for economic growth (Ketchell, 2019). The visible anger and emotion heard in the language and delivery of her messages, contravened Western cultural expectations of young women, resonated with many youth (Nässén, 2021), and profoundly influenced the recent wave of youth climate justice activism (Verlie & Flynn, 2022). Since the success of the climate strikes, Thunberg has continued to use her celebrity status to lobby for collective action that demands a dramatic shift within corporate and governmental policies to conduct large-scale systemic change.

Nässén (2021) suggested that by placing the emphasis on political leaders, Thunberg has removed the individual guilt many may have felt, a message that contrasts with many current educational programmes that endorse small, individual, and less effective actions (Lee et al., 2020; Li & Monroe, 2019). Thunberg's unflinching and clear messages specifically targeted collective climate change action to lobby for political and corporate responsibility that includes ensuring social justice is key to climate responses. In doing so, Thunberg incited youth (and subsequently many adults) worldwide to join her call and take strike action for their future.

2.7.3 **Climate strikes**

The 2019 climate strikes, held in March, May, and September, grew organically (Tattersall et al., 2022), drawing unprecedented numbers of students out of school and onto the streets. Despite the media reporting scepticism from some politicians, the March strikes in Aotearoa New Zealand were supported with an open letter to the government - signed by 1560 researchers, academics, and educators (Science Media Centre, 2019) who vouched solidarity with the students. The media reported the September climate strike to have 170,000 student and adult strikers in over 45 locations. This is the largest representation of protesting students and one of the largest general strikes to have ever occurred in Aotearoa New Zealand (Deguara, 2019). Youth climate activism was seen to be broadening public debate (Hayward, 2021).

A large-scale, worldwide study of the climate strikes explored youth motivation and the demographics of those participating in the climate strikes. de Moor et al. (2020) found protests were driven by anger, frustration, and concern. Women were more likely to attend than men,

with a female representation of 71% at the September strikes. Higher education also featured, with 70-80% of strike participants who reported they had either university backgrounds, or their parents did. Friend networks were considered important; 67% were asked to attend by friends, creating homogenous groups that were socially connected. Politically, many respondents to the survey expressed scepticism and distrust of political agendas, questioning the capacity of governments to deal with the crisis. Future hope was based around scientific innovation and collective, democratic political pressure aimed to compel governments to bring about the changes needed to mitigate and adapt to climate change (de Moor et al., 2020).

In Aotearoa New Zealand, youth cynicism towards some politicians was reinforced during the March 2019 climate strikes, as a result of the comments by a few significant political leaders, who derided the actions of climate strikers. National MP, Judith Collins, claimed the world would not be helped by the protest, while leader of the opposition, Simon Bridges called the protest 'little', suggesting that strikers may go to McDonald's afterwards (1 NEWS, 2019). Prime Minister, Jacinda Ardern, who previously identified climate change as this generations' nuclear free movement (a reference to the bold stance taken in the 1980's by Aotearoa New Zealand against visits by nuclear-powered ships), acknowledged climate change was a cause for concern but did not want to publicly recognise the value of students' voice through protest in this instance (Woolf & Redmond, 2019). Despite the outpouring of adult support for the climate strikes, these comments reinforced youth perceptions and the assertion that with political agency, if the message does not align with adult opinions, some adults may choose to undermine or patronise youth efforts (Reeves, 2017; Verlie & Flynn, 2022).

Nevertheless, the climate strikes' use of politicisation and intergenerational conflict succeeded in placing climate change on the political and global agenda for many months (Kenis, 2021). The climate strikes highlighted the importance of the Zero Carbon Amendment Act (targeting a reduction of gas emissions - except for biogenic methane) that was being debated at the time and subsequently passed unilaterally. The negative reaction to European stock prices, around the time of the climate strikes, for high carbon-intense companies (Ramelli et al., 2020) was considered an unanticipated outcome of the strikes. Publicity exposed large scale frustration at current systems and the focus on mobilising action also mobilised activism (Kenis, 2021).

The climate strikes provided a day of reckoning for political systems, but also, suggested Verlie and Flynn (2022), for education. Students who participated in the strikes questioned the value of education, arguing that tackling climate change should take priority over education because there was no viable future on a dystopian planet (Verlie & Flynn, 2022). Many strike leaders reasoned they learned more from their experiences as strike leaders *and* many participants

gained more from their experiences at the strikes than they would have at school (Bright & Eames, 2020). Youth who did not attend the strikes expressed doubt that they, as individuals, could make a difference, or in some cases, those who were environmentally vulnerable felt overpowered by more immediate concerns (Walker, 2020).

The climate strikes exemplified a context where youth were challenging adults in positions of power, with a view to impact governmental priorities and an education system that claims to be future-focused yet shows reluctance to engage in or show leadership in climate change conversation (Everth & Bright, 2022; Verlie & Flynn, 2022). The assumptions about and purpose of education requires continual re-evaluation, and as the climate strikers exposed, it is possible that beyond the climate crisis, there might also be an existential crisis within the education system that impacts student engagement. An education system that enhances political literacy and political agency is more likely to heighten climate engagement and is fundamental for progressing climate action (Bright & Eames, 2020; Tattersall et al., 2022) .

2.7.4 **Political literacy**

Political literacy is a combination of knowledge, values and skills that foster understanding of political concepts (Şan & Gedikler, 2020), to develop connections between cultural, political, economic, religious, and social history of local, regional, national, and global contexts - both in the short and long term (Brocklehurst, 2015; Tilbury, 1995). Political literacy is a critical step towards understanding the political and social landscapes that have led to the climate crisis (Stuart et al., 2020), enabling individuals to question, challenge, and become agents of change.

Climate sceptics use the language of freedom fighters to accuse climate policy supporters of being eco-fascists and authoritarians (Counterpoint, 2021; Lejano & Nero, 2020). Increased political literacy combats climate change sceptics who have the capacity to continue to derail support for climate action. Western educational policies are interwoven with market economies with deeply embedded ideologies that enabled powerful corporate organisations to continue to oppose or manipulate radical climate action (Nairn, 2019; Robinson, 2015; Stuart et al., 2020). The climate strikes highlighted the need for emancipatory transformation, but to also facilitate dramatic change, political literacy is required to cultivate an understanding of the political influences and factors that have brought us to this place (Lowe, 2002). Only by encouraging an outpouring of public opinion and support large enough to drown out the voices of those who resist can there be a move away from neoliberalist ideology, to overcome the economic influence of corporate power and enable climate action to stand a chance (Orr 2020).

The role of movements such as the climate strikes is not solely to convince politicians, it also provides a platform to convince voters that climate action should be at the forefront of policy. It is acknowledged that policy does not always translate into practice, increasing pressure from voters is likely to provoke meaningful commentary and pressure in the political climate at any given time (Harring et al., 2021). The COVID 19 pandemic has shown how nimble and proactive governmental policy in Aotearoa New Zealand can be, and how quickly views can adjust, if the risk of inaction and possible consequences are deemed significant enough for society.

The challenge for climate change action is that it is thwarted by the discrepancy that often exists between individual attitudes and their behaviours (Kollmuss et al., 2008). Tensions and cognitive dissonance occur when action leads to discomfort or inconvenience, which is why increased climate education is required to enhance understanding that, as Thunberg states, the house *is* on fire (Ernman et al., 2020). Improved political literacy is more likely to energise individuals to utilise their democratic power and support legislation that prioritises mitigation and adaptation policies - despite the impact on their personal lives. Mandates as restrictive as those imposed by COVID 19 and the policies essential for meaningful climate action both require reciprocal trust between civilians and politicians (Harring et al., 2021). Ethical transformations require an understanding of the democratic power that individual choices can have on political forces, and consequently, environmental outcomes (Beals & Wood, 2012). Having a greater understanding of political issues increases youth civic engagement (Act for Youth, 2022) and leads to greater political agency.

2.7.4.1 Political agency

Political agency empowers youth to believe that they can make a difference and gives them the tools and confidence to act (Wenmonth, 2014). Despite historical youth activism, those youth identified as political agents or transmitters of the political process are rarely the subject of research (Brocklehurst, 2015). Provisioning political literacy and agency within education has also been marginalised. It seems the issue of youth political agency is a relatively new concept; identified as essential for change, yet the mechanisms of acquisition and associated behaviours are poorly understood, or potentially not well supported by secondary teachers if it might impact the nature of learning and dialogue in their classroom.

The Social Science Learning Area of the *New Zealand Curriculum*, identifies the value of political agency, stating students should learn "how societies work and how people can participate as critical, active, informed and responsible citizens" (Ministry of Education, 2007b,

p. 30). Further, political agency is linked to greater academic success (Ballard et al., 2019). However, in the 2018 Aotearoa New Zealand general elections, 37% of youth enrolled (aged 18-24) chose not to vote (Reeves, 2017). This low turn-out implies youth were politically disengaged and perhaps perceived that politics were irrelevant to them. Reeves' research also identified that when an attempt was made to engage students, they sometimes felt patronised or stereotyped, which impacted their sense of agency.

Youth agency may be further complicated where cultural norms are interplayed with technologies and social networks (Boulianne, 2020). The execution of a course of action develops from multiple factors including the degree to which an individual believes in their ability to achieve their goals (Bandura, 1977; Sass et al., 2021). Technology is one factor that may impact individuals' perceived sense of agency (Owens & Driffill, 2008). For example, narratives from documentaries, films, social media, and live role models were found to be influential in developing youth political agency (Sass et al., 2021). Specifically, some youth who circulated social media related to the climate strikes but did strike themselves or take further action. Their passive contribution was still significant because it supported the snowballing effect of awareness, and thereby increased political pressure (Cologna V, 2021).

The climate strikes have exposed students' voices and brought their climate concerns into the political arena. By participating in the strikes, it is likely youth gained a greater understanding of, and personal connection to political systems, whilst also flexing their own political agency. Youth with political agency have a personal sense that they can make a difference, and have the tools and confidence to act (Wenmonth, 2014).

2.7.5 **Social and climate justice**

As with growing awareness of the need for political agency, increasingly, the climate crisis has also been defined as a moral and ethical issue (Stuart et al., 2020). Understanding these critical phenomena and their role in climate change is a crucial component to climate change education (Verlie & Flynn, 2022). The nature of social and climate justice underpinning this research is now discussed and importantly why there is a view that we must also expand the focus from humans to consider ecological justice of all living species and ecosystems. The pivotal role of social justice in successful climate change and education is also discussed.

The concept of social justice grew from the social inequities of the industrial revolution (United Nations, 2006). A simple definition of social justice was outlined by Miller (2001), who suggested that both positive and negative outcomes should be distributed equally among all members of society. Social justice includes the institutional responsibility of equal rights,

opportunities, and a distribution of wealth throughout society, which may include social insurance, public health, labour laws, taxation, regulation of markets, public service, and public schooling. Social justice plays a key role in facilitating equitable allocation of resources and outcomes (Robinson & Shine, 2018).

The social justice ethos gained traction in the late 1990's. Environmental movements that had previously lobbied for social and environmental justice became frustrated with growing injustices and what they considered a *failed* global governance model that had explicitly addressed climate change (Tahseen, 2018). Climate justice presents a view that climate action must ensure the just and equitable distribution of responsibilities, burdens, and benefits of climate change. At the core of equitable climate action is a mandate to safeguard the vulnerable against further deprivation (Dooley et al., 2021; Thaler et al., 2017). However, powerful entities typically promote their own interests, while vulnerable parties commonly cannot. Climate justice seeks to protect human rights in the most vulnerable communities, consider the rights of indigenous peoples and address the ecological debt that is owed by transnational corporations and industrialised countries (Foran et al., 2019). Both social and climate justice concepts are pertinent to this research.

Climate change education with a focus on social and climate justice and adopting a critical pedagogy, would aim to increase awareness of the inequities facing climate vulnerable communities and the potential inequities they would likely face as the result of mitigation and adaptation processes. For example, low socio-economic communities, are traditionally more likely to depend on rapidly changing and climate sensitive sectors, such as farming and fishing, for their livelihoods. These communities may struggle to transition away from carbon intensive processes if fossil fuels provide the most affordable source of energy. Vulnerable countries who already endure poverty may become further impoverished if mitigation entails accelerating the price of, or reducing access to, fossil fuels before the communities are supported to establish suitable and sustainable alternatives (Shue, 2014). The physical and economic resources needed to adapt are lacking in a large proportion of vulnerable populations (Momtaz, 2016). Furthermore, the damage and loss of valuable geographic and cultural resources are increasingly relevant for international climate policy (Mechler et al., 2020). Framing climate change education and climate action around climate justice helps to advocate for a mitigation and adaptation lens that privileges equity and collective rights, whilst addressing environmental, social, political, and ethical concerns. These concerns include recognising the responsibilities of countries that are historically high emitters of greenhouse gases.

Fundamental to climate justice practice is the acknowledgement that industrialised countries have historically produced significantly more greenhouse gas emissions and been responsible for intense environmental degradation. These countries have greater culpability and must be challenged to take ownership of the role they have played in the climate crisis (Foran et al., 2019). Many consider that wealthier countries who have profited from excessive greenhouse gas emission lifestyles have incurred a "carbon debt" to vulnerable countries and must provide compensation (Khan et al., 2020). At the Pacific climate change conference in 2018, the Aotearoa New Zealand Minister for Pacific Peoples, Aupito Tofae Su'a William Sio, called for the development of policies to manage climate-induced migration from the Pacific Islands to New Zealand (Cass, 2018). A framework is required that addresses the increasing socioeconomic inequities resulting from a changing climate (Foran et al. (2019)

There is a view that climate justice must also extend beyond the rights of human beings to include the rights of non-human species. Ecological citizenship considers humans to be only one component of a complex ecosystem (White, 2012). Ecological justice, another extension of social justice, considers the ethics surrounding justice for non-human species. The Anthropocene has been notable for mass extinctions and environmental degradation (or ecocide) that include toxic waste, overfishing, illegal logging, water pollution and animal abuse (Kopnina & Washington, 2019). Understanding the wider ramifications of the Anthropocene and the-world-is-made-for-me neoliberal ideology, deepens awareness of the root causes of climate change. Ecological justice considers the responsibility humans have to interspecies and intergenerational justice, irrespective of their value to today's humans, concentrating the climate action lens on the ethical rights of *all* species (Barad & Alice, 2007; Kopnina & Washington, 2019; Sidebottom, 2021; Verlie, 2017; Wienhues, 2020). Increased politicisation of ecological justice has helped to centralise the concept and with a growing understanding of the need for ecological justice, the pronoun 'we' can no longer refer only to humanity.

While contemporary Western climate change literature explores the ontological significance of interconnectivity of all living and nonliving elements, for indigenous cultures, such as Māori, this important concept remains central to their cultural philosophies and practices. The importance of understanding indigenous knowledge for climate change education is now discussed.

2.7.6 **Indigenous knowledge**

Indigenous cultures have a reputation for protecting biodiversity and ecosystems to sustain limited resources (Smith, 2020). This section considers the historical value of indigenous

knowledge in light of Eurocentric climate action and the statutory obligations of Aotearoa New Zealand under the Treaty of Waitangi. The embedded nature of interconnectivity within the Māori culture and the Whanganui River is discussed to provide context.

Appreciation of and respect for indigenous knowledge and practices is growing. Traditional neoliberalist political priorities of economic growth have previously conflicted with environmental and indigenous concerns (Carter, 2013), additionally, the climate change dialogue has been largely constructed using Eurocentric logic. Indigenous knowledge has increasingly emerged as an alternative and vital component to the climate change narrative (Nuñez, 2018). The latest Intergovernmental Panel on Climate Change (IPCC, 2022a) report identified the significance of indigenous knowledge for accelerating the wide scale shifts in attitudes and behaviours needed to address climate change. Indigenous peoples are largely responsible for the conservation and protection of the world's remaining areas of high biodiversity (Toledo, 2001). Indigenous cultures comprise 5% of the world's population but protect over 80% of Earth's biodiversity (Sena, 2021), which would to some extent explain why an appreciation of indigenous knowledge and practices is growing. An example of this growth is the Aotearoa New Zealand crown research institute, AgResearch, which has launched a Māori Research and Partnership Group to support their vision of mātauranga Māori (Māori knowledge) as equally valuable as Western science (Jacobs, 2022).

The relationship between Māori and the government outlined in Te Tiriti o Waitangi was underpinned by the principles of protection, partnership, and participation (Smith, 2020). Protection includes the valuing, protecting and normalising of mātauranga Māori (Māori knowledge) as well as tikanga (customs and traditions). Partnership involves working together *with* iwi, (tribes), hapu (sub-tribes) and whānau (families). The participation principal comprises of strengthening relationships that reflect the bi-culturalism of Aotearoa New Zealand (School News New Zealand, 2022). There is legislated expectation and ethical responsibility to include Māori cultural values and perspectives in governmental procedures. In regards to climate change, this is particularly important for encouraging engagement in communities where top-down Western science has been the dominant view (Morrison, 2022).

Symptoms of the climate chaos that we are witnessing stem from the practices of industrialisation and colonisation's need for resource domination. Furthermore, environmentalists from industrialised countries are often highly educated, privileged, white and middle class (Hayward, 2021). Climate action policies based on Eurocentric processes must be challenged to reconsider previously held (often deficit) assumptions about indigenous knowledge (Smith, 2020; Stevens et al., 2021). It is important to consider that indigenous

knowledge does not undermine the critical need to support growing scientific understanding of climate change, but builds on and recognises diverse forms of knowledge, such as oral traditional knowledge and lived experiences (Pou, 2021; Smith, 2022). Māori and other indigenous cultures have a long history of adapting to environmental changes to ensure sustainability of finite resources (Smith, 2022).

Underpinning Māori philosophy is taiao, the interconnectedness, interdependence, and interrelated nature of all living and non-living things. The *Guidelines for Environmental Education* support environmental education to be *in, about* and *for* the environment (Eames et al., 2004). With te taiao, the ethos moves away from humans as an entity separated from their environment, towards an understanding of humans '*as*' or '*as part of*' the environment (McKay, 2014). Core values such as kaitiakitanga (intergenerational guardianship), manaakitangi (love and compassion), and whanaungatanga (connectedness and relationships) ensure long term, intergenerational sustainable solutions could take prominence over easier short-term options (McKay, 2014; McMeeking et al., 2019; Pou, 2021). An example of the practical application of these values occurred with the kaitiakitanga (intergenerational guardianship) over the Whanganui River.

The Whanganui River is the longest navigable river in Aotearoa New Zealand. For local iwi, it was an essential food source and held spiritual significance. Pollution from farming, forestry, a hydroelectric dam scheme, plus the extraction of minerals from the riverbed, destroyed fisheries, eroded the ecological quality, and undermined the spiritual value of the river (Charpleix, 2018; Lurgio, 2019). Whanganui iwi (tribes) initially petitioned Parliament in the 1870's, seeking justice for their river and compensation through the courts. Finally, in 2017 the Te Awa Tupua (Whanganui River Claims Settlement) Act was passed, granting legal personhood status to the Whanganui River, the first in the world. The innovative Act recognised "Te Awa Tupua as an indivisible and living whole, comprising the Whanganui River from the mountains to the sea, and all its physical and metaphysical elements" (New Zealand Parliament, 2017th para.). The enduring determination of local Māori, based on kaitiaki (intergenerational guardianship) principles led to action that addressed historical and colonial injustices, resource exploitation and environmental challenges. The heightened understanding of indigenous knowledge and rights was beneficial for all and showed how social and climate justice are intertwined with environmental restoration.

There is not only a moral obligation for climate change education to promote understanding of indigenous knowledge, climate, and social justice, but putting the climate crisis in this context

is also likely to enhance youth engagement (Bright & Eames, 2020; Kopnina & Washington, 2019; Verlie & Flynn, 2022).

2.7.7 **Student voice**

The interplay between empowering student voice and heightened engagement requires student consultation (Nelson, 2015). In a world of increasing complexities, vulnerabilities and environmental urgencies, secondary schools have changed less since the industrial revolution than the adolescents they serve (Freire, 2015; Irwin, 2020; Kane & Maw, 2005). Increasingly teachers and their pedagogies appear to be out of touch with students' interests and lives (Braus (2020).

Without student voice, pedagogical practices can be considered incomplete. For example, research that led to the development of Te Kōtahitanga programme examined the messages recurring in the narratives of young Māori students (Bishop, 2003). They found optimal conditions for classroom learning involved listening to students and respecting their perspectives; they allowed students to voice what impeded their engagement and learning, their views often challenging entrenched cultural and social assumptions (Cook-Sather, 2018). By empowering student voice, the Te Kōtahitanga programme was developed to enhance, and in some cases, transform pedagogical processes (Bishop, 2003; Kane & Maw, 2005), heighten engagement, and contribute to more equitable learning and social outcomes.

Educational research has advocated for student voice, and in doing so acknowledged that students have a unique and important perspective regarding school and classroom-based practice (e.g., Cook-Sather, 2018; Cowie et al., 2010; Mansfield, 2014). Student consultation has exposed articulate and well-formed views from learners regarding their educational possibilities and provided an impetus for developing pedagogies that can address disengagement, as well as support and improve learning outcomes (Kane & Maw, 2005; Nelson, 2015). Educators committed to shaping engaging pedagogical practice need to empower youth voices, particularly if they want their students to become agents of change.

The *New Zealand Curriculum* advocates for students to "seize the opportunities offered by new knowledge and technologies to secure a sustainable social, cultural, economic and environmental future for our country" (Ministry of Education, 2007, p. 8). As with Freire's concept of 'truth', it is possible that students' understanding of these opportunities may not align with those of adults' perspectives. Generational misunderstandings and intergenerational injustices of climate change might result in students' perspectives on climate change education being viewed through an entirely different lens to adults. Empowering student voice presents

opportunities to reveal relevant, innovative, and exciting pedagogical approaches. Accordingly, consultation and co-operative learning with students are vital to progress formal education, one of the crucial settings for the delivery of climate change education, and to encourage widespread engagement (Gough, 2015). School leadership plays a crucial role in directing the culture and opportunities available to their students.

2.8 **Youth engagement**

Youth engagement and voice are intrinsically interconnected. This section explores the significant role educators play in engaging youth with climate change education and how this potentially impacts academic achievement.

Youth or student engagement is considered a complex construct and when related to classroom learning identifies the importance of thinking (head), feeling (heart) and doing (hands) (Zepke, 2018). Student engagement or, 'energy in action' (Appleton et al. (2006, p. 428), illustrates the relationship between the activity and the person, impacting positively on academic, cognitive, psychological, and emotional wellbeing. Engagement *and* disengagement are both considered dynamic and malleable contextual constructs that may fluctuate across locations and time (Havik & Westergård, 2020).

Engagement is considered to be derived from competence, autonomy, and relatedness in self-determination theory (Ryan & Deci, 2000). This reflects the importance of social-contextual conditions which suggests that communities who are socially and economically dependent on carbon intensive economies may show reluctance to acknowledge climate change and are therefore less engaged with climate action.

Student engagement is linked closely to academic achievement (Act for Youth, 2022; Havik & Westergård, 2020; Olivier et al., 2018), with educators and their choice of pedagogy playing a significant role in engaging or disengaging students (Appleton et al., 2006; Havik & Westergård, 2020; Li & Monroe, 2019; Pedler et al., 2020; Wang & Degol, 2014; Zepke, 2018). A Norwegian study of 1769 tenth grade students from ten schools identified four key components teachers utilise to engage students - offering emotional support, quality teaching practice, quality student interactions, and encouraging students' sense of belonging (Havik & Westergård, 2020). Such findings align with studies in Aotearoa New Zealand that found the most important factors to ensure engagement included positive teacher interactions, the structure of lessons and the relationships students have with their peers (Bishop, 2003; Bolstad et al., 2012). What is of interest for my research, and with consideration of the climate strike leaders, is the suggestion that students' sense of identity is interwoven with their learning

experiences. By co-constructing their learning within an agentic (supportive) environment, there is a view that students can feel empowered and in control of their learning experiences leading to improved engagement, and ultimately, greater agency (Bell et al., 2017; Reinsfield, 2018).

Engaging students towards understanding climate change can be challenging and for students who have not yet personally experienced the impacts of climate change or who do not live in climate sensitive environments, climate change may appear an abstract concept (Markowitz et al., 2018). In addition, climate change education may disengage students if they experience negative emotions when confronted by dire environmental forecasts promoting climate denial. Markowitz found students who showed a broader understanding of the social and political constructs around climate change were more likely to be motivated towards pro-environmental action. Further engagement in environmental concerns is likely to be increased by using active and engaging teaching strategies that focus on relevant and personally meaningful information (Li & Monroe, 2019).

According to Bolstad (2020c), the education sector must become more responsive to the issues of climate change by offering informed and local understanding of the causes and consequences of climate change. To enhance classroom engagement with climate change, educators must themselves show greater levels of engagement (Tattersall et al., 2022). This requires deliberate discussions about climate change to actively address any misconceptions (Li & Monroe, 2019). The interaction with scientists and the implementation of school or community projects is likely to enhance engagement and motivation. Further, by encouraging individuals to acknowledge the positive emotions evoked when they are part of and observe nature, there are opportunities to significantly heighten local environmental understanding, engagement and action (Ernst & Theimer, 2011; Lankenau, 2018).

With acknowledgement that adolescence is developmental in nature and a time when independent values are often developed and consolidated (Barni et al., 2011), engaging students at secondary school requires consideration of youth perspectives.

2.9 Leadership in Aotearoa New Zealand schools

Those who provide educational leadership including principals, departmental heads and boards of trustees have significant influence within their educational institution and in the community (Eames et al., 2021; Gardner-McTaggart, 2020). Secondary schools prepare youth for future citizenship and school leadership has a profound role in shaping the decisions our future

citizens make. In this section the transformational role of leadership and associated challenges facing schools and climate change education are discussed.

Leadership is defined in the *Best Evidence Synthesis Iteration* as "guidance and direction of instructional improvement" (Robinson et al., 2009, p. 9) and underscores the influence principals have within their school culture (Everth & Bright, 2022; Scott et al., 2016). Principals are required to consider the multiple needs of many, including students, teachers, non-teaching staff, parents, and caregivers - as well the impact on neighbouring properties and local businesses (Alonso-Yanez et al., 2021).

The 1989 educational reforms in Aotearoa New Zealand called 'Tomorrow's Schools' created a structure that transferred governance from a central education board to a parent-volunteer, community led, Board of Trustees. This increased principals' day-to-day responsibilities in several ways, including a requirement to work with community-elected Boards on governance concerns and managing the school's marketing profile. The impact of these reforms remains pervasive. For example Alonso-Yanez et al. (2021) identified that 80% of Aotearoa New Zealand schools compete with other schools for students in their area, thus promoting the view that academic and cultural success within a school community is part of the lifeblood of the school. Individual schools are still funded per decile rating, with lower decile schools receiving more funding per student. For example a Decile One school may receive $805 per student, compared to a Decile Ten school that may receive $47 per student (Haque, 2017). Tomorrow Schools' educational reforms led to the creation of largely autonomous organisations that reflected and represented their community (Novlan, 1998), as well as local competition for student numbers. The implication is that in communities where there is socio-economic reliance on carbon intensive industries, such as through dairy farming, there may be stronger resistance to climate change education.

The role of school leadership is critical for the vision and development of a school culture (Alonso-Yanez et al., 2021; Everth & Bright, 2022; Service & Thornton, 2019). The educational leaders' role is multifaceted and challenging. Effective leaders improve teaching and learning by evaluating and monitoring classroom instruction, ensuring open communication channels, and creating a cohesive school culture. Such leaders also create systems that build vision, monitor teacher effectiveness and student progress, manage learning and teaching programmes, enhance professional development opportunities, provision teaching resources - all while managing and maintaining the school infrastructure. The challenges and complexity of leadership are compounded by the time constraints and limited opportunities

offered to leadership to pursue their own professional development (Service & Thornton, 2019).

The world, particularly for youth, is now dominated by uncertainty, complexity, volatility, and ambiguity, with growing demands on schools to support the increasingly complex needs of youth (Shield 2013). Compounded by a lack of vision and leadership drive, climate change education has received minimal resourcing and missed out on the capacity building required to support both environmental and societal challenges in Aotearoa New Zealand secondary schools (Everth & Bright, 2022).

COVID 19 resulted in regular lockdowns where people were confined to their homes. This forced urgent and innovative solutions in education and as a result schools have shown greater flexibility in the design and delivery of classroom lessons (Rincones et al., 2021). While responding to COVID 19 has eclipsed other priorities, the adaptive nature of such leadership could provide a model for thinking about and enacting climate change and sustainability education (Bolstad, 2020a). Bold, transformative leadership is required if schools are to successfully prepare their students for the challenges and reality of climate change.

2.9.1 **Transformational leadership**

Transformational leadership can shape the culture of schools and provide opportunities that influence the praxis of education . To exert such influence, leaders must embrace vision, clarity, agility and understanding combined with insight, foresight, and action (Shields, 2017). Freire, in the *Pedagogy of the Oppressed*, suggested transformative leadership should involve four key elements; critical awareness or *conscientisation*, critical reflection, critical analysis and critical action (Eley & Berryman, 2018; Freire, 2015). Of interest in this research was how leadership, at both micro and macro levels, might urgently and critically become agents of change in their schools, to prepare the population for a climate altered future (Kwauk, 2020).

Such agency might be observed through cultural transformations, which include adapting the school infrastructure towards establishing zero carbon emissions within the school facilities (Sadan & Alkaher, 2021). The carbon footprint within the education sector is significant - with land occupation, transportation fleets, food wastage and energy consumption. While Jensen and Schnack (2006) argue that schools do not become ‘green’ simply by conserving energy or recycling, future-focused principals who factor in the environmental impact of their school’s infrastructure (Bauld, 2021) model a transition to zero carbon alternatives to their respective communities.

Traditionally, secondary schools conformed to old systems, ensuring the cultural reproduction of their communities and thus retaining the social and political status quo (Freire, 2015; Gilbert, 2015; Irwin, 2020). However, the call to embrace and adopt transformative educational practice was made by climate strike leaders at the University of Auckland Sustainable Development Goals workshop (Glasgow, 2019). The strike leaders' hope was that with effective school leadership that shapes consciousness, cultural norms might shift beyond the influence of family and traditional systems (Nash, 1990). The recent reset of the *New Zealand Curriculum* to position Māori history in the core curriculum for year 1-10 students also shows a commitment to move away from the traditional colonising ideologies in education (Panel, 2021). The idea that schools must shift their focus from one of cultural reproduction to one of cultural transformation is in line with Freire's thinking, and reflects the emerging themes in climate change educational research (Bolstad, 2020a; Everth & Bright, 2022; Irwin, 2020; Kwauk, 2020).

The Te Kōtahitanga programme is an example of a programme focused on cultural transformation that occurred in selected Aotearoa New Zealand schools. The initial focus aimed to enhance culturally responsive pedagogies and support a shift in school structures (Bishop, 2019). However, pedagogical changes alone were found to be insufficient without the support of school leadership and student management (Eley & Berryman, 2018). For the programme to be effective, it required resourcing of a permanent senior teacher and ongoing collaborative, cross-curricular support from principals to achieve whole-school change (Bishop, 2019; Meyer, 2021). The Te Kōtahitanga national programme was successful with the Ministry of Education reporting evidence-based improvement of Māori engagement and achievement in participating schools that was significantly higher than in schools who did not participate in the Te Kōtahitanga programme (Ministry of Education, 2021a).

Programmes such as Te Kōtahitanga provide an example of the results that can be achieved with transformational leadership. Transformational leaders can enable cross curricular collaboration, locally-focused learning and a shift in school values, procedures and pedagogies to raise schoolwide engagement (Everth & Bright, 2022).

2.10 Pedagogies

A central focus of this research pertained to the implications of strike leaders' perspectives on engaging pedagogical educational practice. Sir David Attenborough suggested modern youth are environmentally disconnected (MacDonald, 2016), yet paradoxically, the climate strikes

engaged millions of youth globally towards a collective goal of environmental sustainability. What pedagogical insights can be gained from this engagement?

Effective climate change pedagogy moves the learner beyond simply knowing about climate, which infers a disconnect between 'it', (the climate) and us, to understanding the interconnectivity of all living and non-living systems, or as Verlie (2017) called it, *becoming climate*. This chapter briefly reviews the literature on the role of transformative pedagogies and considers critical pedagogies that may enhance an understanding of 'becoming climate'. These include consideration of ecopedagogies, the pedagogy of discomfort, and action competence.

2.9.2 **Critical pedagogies**

Critical pedagogies encourage students to critically evaluate their world and then participate in the transformation of it. Transformative education advances a multi-faceted approach with a focus on both personal and public good (Lotz-Sisitka et al., 2015).The transformative power within critical pedagogies lies in the emphasis on exploring inequities and social injustice (Shor, 1993). Transformative pedagogies apply cognitive, emotional and psycho-social processes that build capacity to think critically, explore dilemmas and shift perspectives that may encourage a shift in behaviours and attitudes (Vare & Scott, 2007).

Freire referred to traditional pedagogies as a 'banking concept' that allowed knowledge to be bestowed on students to passively absorb from a curriculum imposed by the dominant culture with the aim to reproduce privilege and the status quo (Dewey, 2008; Kwauk, 2020; Verlie & Flynn, 2022). As the bank of knowledge fills, Freire theorised, critical consciousness becomes increasingly compromised. Freire advocated a critical pedagogical approach that invites both educators and students to ask *why*, to examine and question existing strategies and explore contextually how best they may learn. However, transformative pedagogy of this nature may require many secondary teachers to revisit or reconceptualise their traditional and preferred practices.

Critical pedagogy presents a number of difficulties for implementation in everyday classrooms (Fobes & Kaufman, 2008). Firstly, critical pedagogical ideas of authenticity rely on recognition and representation of a social community over and above the place of individual identity. Classroom implementation of an ideology that prioritises societal needs above individuals may be considered contentious and contrary to the educational expectation to focus on the individual needs of students (Durst & Thelin, 2006). Secondly, re-socialising students and teachers to adjust to a different classroom power dynamic may be challenging, particularly with a teaching approach that stems from liberal and leftist political leanings. Thirdly, some students may be

unable or reluctant to co-construct learning opportunities (an approach that emphasises collaborative learning, with teachers providing opportunities for students to co-construct knowledge (Daniels, 2016)), or self-direct their learning. Fourthly, within a Western industrialised education sector where outcomes are expected to be universal, measurable, and replicable, standardised assessment may be difficult. These concerns identify some challenges associated with critical pedagogies but for the societal transformation needed to address climate change requires the education sector to be uncharacteristically bold and take risks.

Critical pedagogy that is transformative requires a background ethic that goes beyond the transmission of knowledge to promote problem solving and foster epistemological curiosity for both learners and educators (Fobes & Kaufman, 2008). Many aspects of critical pedagogy, while not incorporating climate change education, are already embedded in Aotearoa New Zealand schools. The *New Zealand Curriculum* moved away from the notions of traditional knowledge-filling techniques to present inquiry-based and student-based learning pedagogies as preferred approaches (Ministry of Education, 2007b). These approaches tend to be more accessible to primary schools as secondary school continue to struggle with the philosophy and holistic nature of such learning (Bolstad, 2020a). This is reflected through the maintenance of siloed curriculum, or in day-to-day operations of the school (e.g., timetable stricture). Research indicates the tools offered to guide secondary school efforts towards integrated and holistic inquiry-based pedagogies in secondary schools are a work in progress (Brignall-Theyer et al., 2010; Eames & Barker, 2011; Warner & Elser, 2015).

Pedagogical praxis that delivers climate change education as disparate, or science based information is unlikely to motivate attitudinal or behavioural change (Chawla & Cushing, 2007). As previously discussed, the complexity of climate change requires pedagogies that advance an understanding of climate change science, social justice issues, political literacy and agency, and indigenous knowledge while potentially addressing heightened anxiety, *and* facilitating or motivating action. Research suggests many teachers are not only willing, but feel it is vital to take on the substantial challenge of climate change education (Everth & Bright, 2022; Teach the future, n.d; Verlie et al., 2020), but require support to translate their understanding into pedagogical practice (Birdsall, 2015; Bolstad, 2020a; Bolstad et al., 2015; Zocher, 2020).

Critical pedagogies such as the *pedagogy of discomfort* and *ecopedagogy* offer a means to address anxiety and encourage transformative thinking using an investigative and systematic process.

2.9.3 **Pedagogy of discomfort**

The pedagogy of discomfort is a theoretical approach, not specific to climate anxiety, but conceptualised by Boler (1999) to ease anxiety generally. The conceptual framework aims to be transformational by inviting individuals to explore the root causes behind their anxiety and develop active strategies that encourage participants to reflect and identify their perceptions, as well as realising key knowledge that may be missing and causing uncertainty. The focus is on critical reflection that leads participants to a newfound awareness that opens the possibility of the types of action required to relieve their anxiety. Boler suggested that students *and* educators should critically assess their ontologies (what we believe to be real (Grix, 2002)), epistemologies (how we have come to understand the world and what procedures we have used to gain our knowledge (O'Leary, 2017)), and axiology (what we give value to (Oppong, 2014)), in relation to their personal environment at this point in time, and evaluate the connections in consideration of their hopes for the future.

Climate change compels us to reconsider our personal relationship, and that of humans as a race, with the natural world and how the Earth's processes, politics, and socio-economic cultures are entangled (Graham, 2019; Verlie, 2017). The juxtaposing of personal identity and future hopes with the complex needs of an interconnected planet may help to focus the possible causes of eco-discomfort and anxiety. The aim is to deeply explore connections, turning the spotlight on possible causes of discomfort that are obvious, as well as considering those that are less obvious or unseen. While grounded in critical theory, Boler (1999) suggests there is no political agenda with the pedagogy of discomfort, other than suggesting the discomfort stems from some form of societal dysfunction. The pedagogy of discomfort aims to link the possibility that emotions and values are reactions and reflections to the dominant culture and to this moment in history.

The pedagogy of discomfort parallels transformative theory by creating a meaningful frame of reference, through exploring the disorientation experienced with epistemological and socio-cultural insights (Kokkos, 2019). Firstly, educators co-construct with students by participating alongside students to encourage consideration of who they feel themselves to be, their interconnections, their values – considering the interconnections within communities provides opportunities to gain strength and solace (Macy & Johnstone, 2012). The second stage asks for flexibility and invites participants to consider shifts in values and behaviours. Reflections encourage the participant to be more than spectators, to actively observe and sharpen their lens to increase understanding of the root causes of the disorienting dilemma. By critically evaluating how emotions and anxiety are entangled with their observations, society's

expectations and the participant's values and hopes for the future, may lead to an understanding of how transformational shifts at an individual, societal or global level could benefit them. The critical reflections are crucial for realisations to emerge that promote agency and motivate action.

The pedagogy of discomfort aligns with recent climate change educational research that recognises broad scale transformations will be influenced by newfound understanding that encourages individuals to drive collective action (e.g., Li & Monroe, 2019; Reid, 2019). Collective action can also be driven through the use of ecopedagogies.

2.9.4 **Ecopedagogies**

Ecopedagogy is where pedagogy and ecology merge. The Western concept of the Anthropocene has largely detached human systems from the natural world, resulting in a significant decline in knowledge and connection with natural ecosystems over the past 50 years (Attenborough, 2020; Bang, 2020; Howell & Allen, 2019). An ecopedagogy focuses on developing an understanding of how humans and climate are ontologically inseparable (Verlie, 2017).

Ecopedagogy aligns with mātauranga Māori (Māori knowledge), where the central philosophy is the interconnectivity of all living and non-living things (Goodall, 2019). Engaging pedagogies nurture the realisation that the wellbeing of humans is entangled with the wellbeing of other species and planetary systems. This facilitates an understanding of the conflict that currently exists between natural systems and the exploitation of natural resources, and empowers the individual to challenge political or corporate hierarchies (Korsant, 2022). An ecopedagogical approach aims to build relationships between and within the human and more-than human world (Tulloch, 2016; Zocher, 2020) and consider the eco justice beyond anthropocentric needs.

In the 1970's Freire vision described a view of Earth as oppressed (Freire, 2015; Zocher, 2020). He acknowledged that humans may be distressed to learn they are oppressors of the Earth. Pessimistically he suggested that the realisation would not necessarily lead to a solidarity with Earth. Freire's insight addresses concerns expressed by Tulloch (2016) that the "responses to our current environmental and related social crises are clearly framed within the same logic that produced them" (p. 191). Tulloch argued it is no longer enough to simply challenge ideologies that have supported a neoliberal and globalised system; instead, the response must include critical awareness of the individualistic and exploitative regimes and promote global alternatives to the current model of development. Ecopedagogies align with political literacy

by considering critical citizenship models that deepen understanding of the connections between environmental harm, human acts, and social justice to depart from "civilized, enculturated, domesticated, schooled/disciplined pedagogies" (Zocher, 2020, p. 235). The aim is to foster critical thinking that challenges previously justified exploitative norms and promote solution-based planetary connections and wellbeing (Kwauk, 2020; Zocher, 2020).

An example of an ecopedagogical approach that is currently operating in some Aotearoa New Zealand schools is action competence.

2.9.5 **Action competence**

Action competence is grounded in critical thought with the aim of empowering learners through key educational concepts that support localised, inquiry based, environmental education (Eames & Barker, 2011). The four key components consist of gaining knowledge, being committed, showing vision, and experiencing action (Jensen & Schnack, 2006). The Ministry of Education's (2020) *Education for Sustainability* learning guide recommends action competence as an approach that develops "a broad range of competencies to guide appropriate action, and the ability, attitudes and values, willingness and opportunity to act" (Eames, 2010, p. 2).

Action competence grew from scepticism around environmental educational approaches that focused on individual action and modification of behaviours (Jensen & Schnack, 2006). However, the effectiveness of focusing sustainability on individual behavioural modification was considered to not necessarily ensure authentic, long-term changes needed to address environmental challenges (Jensen & Schnack, 2006). Targeting an outcome was considered a more effective motivator. Simply taking action is not the same as action competence; while taking action may help develop action competence, action competence requires evidence of cognitive processing, consideration of interconnected issues and defined targets. For example, cleaning up plastic from beaches, while a useful action, does not address the root cause of the issues. A targeted plan that aims to reduce the amount of plastic in the ocean would be action competence in action. Action competence works at a broader and deeper level encouraging insight into political and social structures and encourages forward thinking strategies that consider and address the root cause of the problem, growing understanding, and agency towards creating a sustainable future.

Action competence offers aspects that support the fundamental themes in climate change education, such as learning that is reflective, personally relevant, active and interactive (Monroe et al., 2019). The *New Zealand's Curriculum* key competencies tie in with action

competence and should be viewed holistically (Eames, 2010) with connections between the curriculum learning areas and the wider school community. In the secondary school context however, Li and Monroe (2019) identified there is limited research into the level of engagement, effectiveness and outcomes associated with action competence. There are further concerns around the assumption that students possess the level of ability required to self-regulate and engage. Self-directed learning requires students to be supported in their learning, particularly when taught within an integrated approach to the curriculum (Fobes & Kaufman, 2008; Reinsfield, 2018), a process that many teachers do manage when school structures support them to do so.

Action competence was identified in *The New Zealand Curriculum* as a way to individualise learning while also considering societal needs (Ministry of Education, 2007b). Involvement in collective community-wide responses are considered effective for scaffolding learners to build knowledge in key areas (Bolstad, 2020c). This approach has been utilised successfully by Enviroschools, the nation-wide Aotearoa New Zealand programme that has become the backbone of environmental education in primary schools.

2.9.6 **Head, heart and hands**

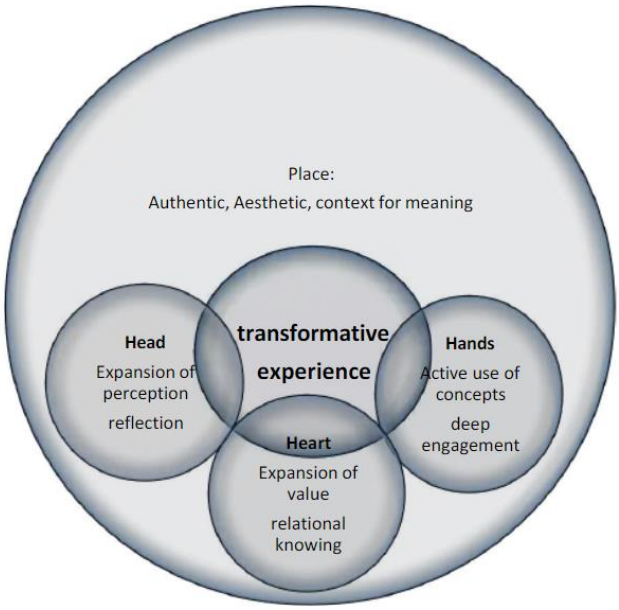
The transformative educational experience of expanding perception with active involvement was founded on Dewey's construct that foreshadowed the head, heart, hands model (Dewey, 2009). Freire's socio-emancipatory view extended the concept by contending that education is a political act made meaningful by connecting to society through active participation and contextual learning (Freire, 1992).

The roots of head, heart and hand pedagogy can be found in Orr's (1992) *Ecological literacy: Education and the transition to a postmodern world*, the title of which suggests a transition is required if humanity is to transcend the Anthropocene. Through a collection of essays, Orr examines the root causes of the environmental crisis and promotes the concept of ecological literacy by synthesising the sciences and humanities to broaden understanding of the impact humans have on ecosystems. He introduced a holistic approach for developing eco-literacy claiming education must not only integrate disciplines but also create authentic experiences that engage and expand perception (cognitive), values (affective) as well as the active use of learned concepts (psycho-motor) (Singleton, 2016). Orr argued that educational facilities must not only teach about sustainability, but also practice it. By contextually framing learning, deeper reflection and greater engagement is promoted. It is possible that the climate strikes provided a rich context for the strike leaders to engage cognitively, affectively and apply active

use of skills and concepts, mirroring Orr's head, heart, and hands educational construct. The multi-faceted transformative learning approach derived from Dewey, Freire and Orr focuses on both personal and public good. By engaging the domains of the head, heart and hands, empathy, creativity, and problem solving are nurtured (Lotz-Sisitka et al., 2015).

The model presented by Singleton (2016) frames transformative learning as contextual and each domain contributes separately. The head, cognitively expands perception and reflection to draw connections from knowledge and previous experiences. The heart fosters emotional investment and critical reflection which empowers and encourages willingness and thus promotes action. Active participation builds motivation and persistence in the face of challenges, encourages problem solving and enhances resilience. Singleton's head, heart, and hands model, shown below in Figure 2.1, provides an accessible framework for educators to consider transformative education, however it suggests a siloed approach and does not offer the complexity needed to allow the domains to interact and respond to each other reflecting the progressive, iterative, developing or transformative learning that is taking place.

Figure 2.1 Head, heart, hands for transformative learning (*Singleton, 2016)*



To summarise the commonality of the pedagogies discussed in this section is that they are grounded in critical theory and utilise reflection and understanding of political, social, and environmental interconnectivity to encourage the questioning of exploitative and unsustainable practices. Importantly, taking practical action may also help to positively channel youth anger and relieve climate anxiety. Pedagogical practice that explores the connections between

students' personal lives, local and global communities, and the natural world is more likely to motivate both personalised and collective action. In the process a greater awareness emerges of the complex societal elements that have contributed to climate change and the realisation of the transformations required if the climate crisis is to be addressed

This literature review generated the theoretical framework for this study, which is outlined next.

2.10 **Theoretical framework**

The theoretical framework for this research is based on an understanding of the nature of climate change and the impact it has and will continue to have on the planet. There is a growing body of evidence that recognises the key role education plays in addressing the challenges of climate change by developing the knowledge and skills needed to promote low-carbon lifestyles. However, there are a number of barriers to climate change education in secondary schools. Understanding the motivation and experiences of youth climate strike leaders might help inform and enhance educational approaches with climate change education.

The key ideas for this research follow:

1. Anthropogenic climate change exists and is now having, and will continue to have, significant impacts on all species and ecosystems on Earth
2. An apathetic and slow response by Western, industrialised cultures towards climate action is threatening environmental, social, cultural and economic sustainability
3. Youth are anxious about climate change and the 2019 climate strikes may have provided an opportunity for youth to have a voice on climate change. Educational pedagogies must consider the barriers and opportunities offered by the emotional responses to climate change.
4. A Freirean theoretical approach surmises that climate change education in Aotearoa New Zealand has the potential to address youth climate anxiety, encourage cultural shifts and support innovative problem solving for climate action
5. Holistic and critical pedagogical frameworks, such as the head, hands, and heart approach, may offer practical guidance for educators as they prepare youth to respond to climate change

2.11 Chapter summary

The literature review covered the problem of, and historical response to, climate change. Climate change is now extensively acknowledged to be rapid, widespread and intensifying which is leading to some irreversible and catastrophic climate trends (United Nations, 2021).

This review explored the background to climate change education, the barriers facing educators, the high levels of youth anxiety and discussed youth engagement. Climate change education in secondary schools has lacked priority as a mitigation strategy and therefore within the education sector to drive the societal transformations needed for a sustainable future (Bolstad, 2020a; Verlie & Flynn, 2022).

Grounded in Freirean critical theory this review considered the theoretical constructs of critical pedagogical approaches. In particular, Boler's Pedagogy of Discomfort, ecopedagogies, action competence, and the pedagogical framework based on Orr's (1992) head, heart and hands approach were reviewed.

Building systemic capacity within the school systems to adequately support climate change education requires bold leadership - leadership that is prepared to exchange a philosophy of cultural reproduction to one of transformation. To ensure long term, intergenerational sustainable climate solutions, educational research is calling for holistic, cross curricular climate change education that considers indigenous knowledge and climate change science along with the social, economic, and political forces behind the climate crisis (Bolstad, 2020a; Bright & Eames, 2020; Kwauk, 2020; Li & Monroe, 2019; McKay, 2014; McMeeking et al., 2019; Pou, 2021)

This literature review considers transformative pedagogies that suggest engagement invokes consideration of critical pedagogies that reflect, evaluate, and empower participation, typically these will utilise the head, the heart, and the hands (Eames, 2010; Freire, 2015; Kasza & Slater, 2017). The 2019 climate strikes provided a call to action for adults and a day of reckoning for climate inaction *and* educators (Verlie & Flynn, 2022). This research supports the voices of youth strike leaders to progress educators' understanding of youth engagement with secondary school climate change education.

The next chapter outlines how these voices and their implications for education were explored.

Chapter Three: Methodology

3.1 Introduction

This chapter presents the methodological framework, methods, and approach to data analysis for this research. The research was designed to explore the perceptions of Aotearoa New Zealand youth climate strike leaders and secondary school teachers, in regard to the 2019 climate strikes. I sought greater understanding regarding what motivated students to engage with and take climate strike action and considered what pedagogical understanding can be gained from this phenomenon.

My ontological stance is derived from a strong belief in the urgency of the climate crisis, which necessitates societal change, and this led to a research design that used a critical theory lens. The socially situated context of my research was (epistemologically) from an interpretivist stance using a critical approach, which allowed the data to be analysed from a cultural, social, and historical perspective.

Methodologically, by situating the research within an interpretive paradigm, I was able to collect and analyse qualitative data in order to gain greater understanding of the world and the perspectives and reality of youth climate strike leaders. The interpretivist paradigm allows a researcher to embrace multiple social perspectives, maintaining that norms and values do exist but that they are likely to change as people respond to life (Burton, 2009; Oppong, 2014). By using a critical approach, I was able to make deeper connections between and within the social phenomena of the 2019 climate strikes by considering historical, political, and societal norms and constraints (Lincoln et al., 2011).

In order to gain rich qualitative data, that authentically represented strike leaders' perspectives, and considered the complexities of climate change education, the methods of interviews and document analysis were chosen. Interview questions were derived deductively from the research questions and informed by the literature review. Semi-structured interviews with climate strike leaders, teachers and senior school management were conducted via Zoom (an online meeting platform), and as I transcribed the interviews, key words emerged and were systematically noted. Repetition of these key words indicated emerging themes. Thematic coding with NVivo computer analysis software (QSR International Pty Ltd, 2018) further developed emerging patterns and allowed for greater data driven analysis that was grounded. Document analysis from media reports at the time of the 2019 climate strikes were used to

triangulate data gained from the interviews, particularly with strike leaders' perceptions of adult perspectives. Thematic analysis allowed the data to reveal patterns as well as unforeseen factors and thus give meaning to strike leaders' experiences concerning youth engagement and perspectives regarding climate change education.

3.1 Research question

The research questions originated from the aims and purpose of this research. The overarching research question asked what secondary school educators might learn from climate strike leaders' experiences? The four specific questions were designed to guide the direction of the research. Critically, the research questions were framed to focus my curiosity, thereby enabling practical, innovative and significant contributions to this field of studied (Cohen et al., 2018). The research questions were also designed to provide a flexible framework from which to explore participants' perceptions of the 2019 climate strikes; with a view to clarify why and how students became engaged and motivated to take strike action as well as gaining insight into participants views on pedagogical practice for climate change education that leads to climate action. The four questions were:

i) Why now? What has motivated and engaged students to take climate strike action?

ii) Does participation in the climate strikes influence understanding of climate change and motivate action?

iii) What are student and teacher perceptions of educational outcomes for youth who participated in the climate strikes?

iv) What are the implications for future climate change educational practice in secondary schools?

3.2 Methodological framework

The methodological framework was designed to consider the principles that underlie this research, whilst also recognising the limitations, logic or potential, and potentialities of the research methods (Grix, 2002). As the researcher, I was aware that in the search for new, trustworthy understanding, my ontological assumptions and epistemological alignment may profoundly affect the research process (Cohen et al., 2018; Shenton, 2004). I was cognisant that the design for social inquiry should aim to extend beyond describing a phenomenon, to reveal a greater understanding or interpretation of *why* something is happening (Blaikie, 2016).

Since the latter part of the mid-twentieth century, educational research has inclined towards, not only an academic pursuit but also to understanding its role in supporting teachers and guiding pedagogy. Researchers, however, have acknowledged the educational world can be full of contradictions, because it is messy, rich, and complex. Regardless, a rigorous research process has the potential to reveal valuable and rich understanding (Cohen et al., 2018). The understanding gained from social inquiry research has increasingly been positioned as a driver for educational processes and as an integral part of implementing policy (and sometimes justifying it), binding research and politics inextricably together.

The researcher's choice of paradigm can reveal how they view the world, and their theoretical framework identifies what is considered worthwhile knowledge. Importantly, the research design demonstrated deliberate decision-making about the most appropriate methodology to obtain that knowledge. Identifying the particular lens a researcher is using requires an examination of the implicit and explicit assumptions that underpin the research. The political and educational relevance of research that explores climate change education is gaining prominence as awareness around the climate crisis and youth concerns for the future expand (Bolstad, 2020a; Kopnina, 2020; Verlie, 2018). Social science, however, acknowledges the varying ways the world can be viewed and interpreted. A variety of approaches to educational research traverse the ontological and epistemological spectrum, from objectivism to constructivism, positivism to interpretivism (O'Leary, 2017). It is important to understand the philosophical constructs that underpin the research process, and where the researcher sits on the philosophical spectrum. This research is philosophically situated within an interpretivist paradigm using a critical approach.

3.2.1 **Adopting an interpretive paradigm**

An interpretivist paradigm recognises there may be multiple realities and the reality of a situation may vary depending on individual’s past experiences and culture. Ontology considers the nature of reality, of what exists and what we believe to be real. It is the starting point of all research (Grix, 2002). Ontological depth ascertains things that are not immediately apparent in observation (Pratt, 2009). With qualitative research such as this, the ontological premise is interpretative, that is, people make sense of their world by actively constructing meaning from their interactions, social situations, and negotiations (Cohen et al., 2018). Integral to an interpretivist paradigm is the aim to increase understanding of the participants' experiences and worldview of the phenomena that is being researched.

As the scientific evidence and the associated inevitability of anthropocentric climate change accelerates, the ontological implications of climate change shift from one of uncertainty that climate change is happening, and the inconvenience that the crisis may change lifestyles, to political questioning of responsibility, ethics, and agency (Knox, 2015). Axiologically, I believe in the entanglement and equal rights of all living and non-living things (McKay, 2014; Verlie, 2017). Indeed, a healthy biosphere is dependent on this interconnectivity or entanglement. Human dominance has contributed to the biospheric injustices and imbalance that have contributed to today's climate crisis. However, from an interpretative paradigm, climate change is ontologically perceived differently depending on your culture, age, and experiences.

Western colonisation and neoliberalism have presupposed a hierarchy of knowledge, deeming some types of knowledge more valuable than others (Torres-Olave, 2021), a concept challenged by critical theory and indigenous cultures. An ethical aim of contemporary social science research in Aotearoa New Zealand is to decolonise methodologies (Smith, 2021). An interpretivist approach acknowledges ontological and epistemological differences. While this research is grounded in the construction of a Western scientific understanding of climate change, I was also committed to recognising the tension between indigenous world views and Western world views which can offer starkly different perspectives of what constitutes knowledge. This approach supports my ethical responsibility as a researcher to consider and fairly represent all perspectives.

Youth understanding and experiences of climate change differ to that of adults (O'Keeffe, 2021, April 19). The *Medical News Today*, in 2021, reported 75% of youth considered the future to be frightening (Berman, 2021). Hickman, a climate psychology researcher suggested the reason adults do not appear so concerned is because adults are less likely to envisage their future will be impacted by the crisis. Exploring the experiences and perspectives of youth is essential for youth engagement towards meaningful climate change education. Humans have a moral imperative to address and mitigate the ongoing exploitation and dominance inflicted by humans on the non-human world, and this belief has driven my research. These values have influenced my research design, however, as Oppong (2014) suggests, the passion that drives such research can be viewed as not only inevitable but also as desirable.

The ontological positioning for this research is grounded in the need for systemic change to address the escalating climate crisis. I researched the nature of reality for strike leaders in a climate crisis world and explored youths' climate change educational experiences. I consider that "how you see the world is largely a function of where you view it from" (Anderson &

Arsenault, 1998, p. 2) , which means that the strike leaders and teachers' perspectives are likely to recognise generational differences that reflect their individual experiences and future outlooks.

My epistemologically stance is that many variables contribute to how individuals perceive life (O'Leary, 2017). As a researcher, I became another variable in the participants' construct and an integral part of the research process. There is a view that a qualitative researcher can not gain objective data (Oppong, 2014). However, within an interpretive paradigm, objectivity is not the aim, instead, the goal is the exploration of participants' reality, as observed through their experiences and perceptions. The role of the researcher is to embrace these many social perspectives and attempt to understand, demystify, and explain the social reality of the different participants - as if seeing through their eyes (Cohen et al., 2018). Greater possibilities are created when connections are made between and within social phenomena and extrapolated to consider political and societal constraints or expectations (Howell, 2016). Furthermore, the social interaction that produces social phenomena and meaning, indicates that elements are constantly changing (Pratt, 2009).

My research aimed to gain a greater understanding of engagement that led to youth climate action by listening to the *voices of youth*. My role as a researcher was to identify patterns within the data, to interpret the way the world was viewed by the young strike leaders. I considered their perspectives by comparing and contrasting their views with that of teacher perspectives, and through document analysis.

By using an interpretive paradigm, I sought to understand and make sense of the youth engagement behind the climate strike phenomena. Such an approach links to critical theory when the intention is to connect participants' life experiences through a dialogue with history and, in the process, as a means to challenge historical injustices (Howell, 2016). This process offers a strong foundation for understanding the complexities of lived realities in the modern age (Dickson et al., 2016).

3.2.2 **Critical theory**

Critical theory emerged from the Frankfurt school of thought in the 1920's, with roots in Marxism and radical social thought. It derived from the perception that capitalist thinking has created imbalances in society and aims to analyse particular phenomena and strive to create changes for a more egalitarian society.(Cohen et al., 2018; Darder et al., 2003). Progressive educational movements utilised critical theory to question the legitimacy of people or groups in power, and promote a view that education has the capacity to culturally reproduce and

culturally transform. American educational reformer, John Dewey (1859-1952) advocated for education to be a cultivating process that fosters and nurtures, and suggested human experiences resulted from many interacting processes (Dewey, 2009). In this context, knowledge was perceived to be derived from active participation, to discern correlations between experiences and events. A central tenet of education, for Dewey, was to link individuals *with society*, and this is apposite when considering the climate strikes.

Paulo Freire (1921-1997), a Brazilian educator, philosopher, and founding influence in critical theory, considered the pedagogical process as fundamentally political (Goodman, 2014). He, like Dewey, asserted that education is where both individuals and society are constructed (Shor, 1993). As such, education was considered to play a critical role in conditioning and possibly shackling students, but equally, it has the potential to liberate and empower them. Freire argued pedagogies should be constructed on a humanistic value base, which leads to critical consciousness, or 'conscientizacao' - learning to observe contradictions in social, political, and economic systems (Goodman, 2014). By utilising a problem-posing approach, students could link their knowledge with action and in doing so participate in societal change at both local and global levels but for this to happen, critical reflection was considered essential. The key role for educators, according to Freire, is to build 'critical consciousness' that questions the exploitative nature of the existing economic and political systems (Bhattacharya, 2020).

As part of this research, I considered the political, societal, and educational context of youth when exploring their perceptions and experiences of climate action. Understanding how societies have contributed the climate crisis is of value, particularly as many of those responsible for the crisis are graduates of elite educational institutions and are likely to hold influential positions of power (Orr, 1992). As the need for biospheric egalitarianism intensifies so does the importance of critiquing the systems and power structures that have enabled mass extinctions of species and the climate crisis. Critical theory questions the purpose of education, which largely facilitates new generations conforming to old systems; this is of interest for climate strike actions, where youth openly challenged political policies and school systems. If education is to become a catalyst for positive change (Irwin, 2020), traditional educational mechanisms need to dramatically shift from one of cultural reproduction to one of cultural transformation.

By using the lens of critical theory, I assert that students should be supported to critically evaluate their world and then participate in transforming it. Activist movements align with a critical theory philosophy. Critical theory aims to not only understand and question the prevailing phenomena but seeks to redress power balance and emancipate the disempowered (Cohen et al., 2018; Freire, 2015).

Freire reminded educators that education must speak to the daily reality of students' lives and the complexities they are navigating (Torres-Olave, 2021). The scale of the youth-led climate strikes unequivocally showed where the future-focus for youth lies. They perceive their concern around a climate-altered future is not being tackled adequately by political or educational systems and they are demanding societal transformation.

Challenging deep-seated cultural and societal norms can be painful (Verlie et al., 2020). However, the climate crisis demands critical evaluation around the anthropocentric and systemic root causes to enable meaningful societal changes to occur. The climate strikes represented more than just protesting youth, the movement itself has contributed to the social construction of direct action that is critical to tackling the climate crisis (Bowman, 2019). Lobbying governmental action to 'put out the fire' is only one strand of the youth climate activists' motives, argued Bowman; they are also addressing the causes of the crisis and calling for a reconstruction of social, economic, and political systems. Strike leaders recognised the need to focus on systemic change rather than individual behaviours (Wood, 2020) and these visions are potentially world-building. Students in action, questioning, and aiming to transform, are hallmarks of the climate strikes. Both Bowman and Wood call for critical frameworks that support research methodologies to build theory from the vision of youth. A critical theory lens, as conducted in this research supports an inductive process that reflects youth perspectives on past and present societal constraints, while also reflecting their aspirations for education and action.

An acceleration of eco-distress and despair among youth is concerning (Hickman, 2020; Kowalski, 2019; Verlie et al., 2020). Enabling student voice, from a critical perspective, can promote and empower problem-solving, particularly in regards to environmental issues that are not of their making (Payne, 2015). The debilitating nature of eco-anxiety, has presented new psychological and educational challenges. Ojala (2021) argued that Western classroom culture mollifies emotions as a political device to undermine social criticism and disempower youth, yet it is still possible for tangible changes to occur from reflective and critical practice (Ayers et al., 2020). According to Freire, action resulting from critical reflection is valuable for alleviating despair and a necessary component of hope (Freire, 1992). The use of a methodological approach that is inductive and supportive of youth voice is designed to empower participants, while facilitating reflective and critical thought.

The ontological premise that prompted my research design originates from the complexities of climate change, climate change education, and the need for transformational thinking to address the consequences of climate change. A critical theorist would argue that knowledge

has been historically conditioned, and that 'truth' can be independent of immediate social or political interests (Held, 1980). The 'truth' for students involved in the climate strikes is likely to differ from the 'truth' of adults and political leaders. Such a view might support the idea that climate strikes are youth demanding to be heard, representing that students feel disempowered and disregarded within the political and educational system. A critical theory lens supported my aim to explore the youth epistemologies, student and teacher experiences, and perspectives around motivational climate change pedagogies that may lead to transformative practices in the classroom and, ultimately, climate action. For educational practice to be truly progressive having a greater understanding of youth perspectives on economic, societal, and political systems is required to suggest opportunities for meaningful learning and change. Qualitative data can explore hidden meanings and unmask connections that may not be obvious but, when linked, offers the potential for significant insight into how youth view their world, their education, and their future opportunities.

3.2.3 **Qualitative data**

Qualitative research which generates qualitative data offers a detailed and intricate understanding of observable and non-observable actions, attitudes, behaviours, and intentions, focusing on the *why and how* of human interactions (Agee, 2009). The data are concerned with illuminating how people negotiate meaning by considering participants' perspectives and experiences (Bogdan & Biklen, 2007). Qualitative data consider how individuals actively construct meaning that is culturally and context-bound, the data are therefore socially situated, context-dependent, and context-rich (Cohen et al., 2018).

The gathering of qualitative data draws strongly on methods that reveal the direct experiences of participants. These include methods such as, interviews, focus groups, naturalistic observations, surveys, questionnaires, and document analysis. Fundamental to the methods used here, interviews and document analysis, is the continual reflection of the importance of data to the inquiry, which is considered a strength of a qualitative data approach (Agee, 2009). Open-ended questions are typically relied on to capture richness, authenticity, and candour (Cohen et al., 2018). Such research is not concerned with the transferability of the findings, only in the lived realities of the participants (Mutch, 2013). Exploring the perspectives and lived experiences of the student and teacher participants required a methodology that enabled respondents to offer valuable detail on complex issues, providing insight into youth motivation and why they think, act or behave in certain ways. By utilising a qualitative data approach, I was able to gather comprehensive non-numerical data that reflected the varying perspectives of strike leaders and teachers.

The challenge for researchers collecting qualitative data in a critical study is to make sense of the data and the reasons for that data. The large quantity of data typically amassed in a qualitative data approach requires early thematic analysis and careful re-reading to reduce data overload. The intention for this research design was to ground the theory in the qualitative data and thereby go beyond description towards meaningful explanations and a deeper understanding (Guba & Lincoln, 1994) to investigate what motivated youth towards climate action.

3.3 **Research design**

This research design was deliberately selected to coherently and consistently generate and interpret the data.

3.3.1 **Research setting**

My research focused on the 2019 climate strikes in Aotearoa New Zealand. The Aotearoa New Zealand School Strike for Climate movement aligned with global movements to orchestrate three national strikes that protested the lack of political action with climate change. The strikes occurred on the 15th March - 20,000 protesters, 24th May - 50,000 protesters, and 20th September - 170,000 protesters (Deguara, 2019).

My data generation coincided with the 2020 COVID 19 outbreak in Aotearoa New Zealand which closed all schools and locked down communities to keep people at home. My interviews were conducted via Zoom, during this time, over a two-month period with participants who were locked down at home in rural and urban communities throughout Aotearoa New Zealand. My Zoom setting was my home office. The participants were located in their homes during the Zoom interviews, and many strike leaders Zoomed in from their bedrooms and could be seen sitting comfortably on their beds or at their desks with their timetable, calendar, or wall posters behind them. The teachers tended to choose a quiet room away from children or the general activity and noise of the household. The lockdown setting offered unexpected benefits as it often alleviated potential time constraints with interviewees. When interviews had the potential to extend beyond an hour, I checked with participants if that was acceptable, all replied they were happy to keep talking as they indicated that they were enjoying the discussion and had little else to do.

3.3.2 **Participants**

The research participants consisted of two cohorts, the climate strike leaders and secondary school teachers. Sampling decisions may influence the degree to which the raw data represents

the phenomena being researched, suggests (Boyatzis, 1998)). In this research, the strike leaders were purposefully chosen from secondary school students who were motivated to take action. Initially, the sample representation of climate strike leaders were identified by their presence in the general media, their public profile, and association with the climate strikes. They were approached through social media and, if keen to participate, were emailed more detailed information about the research (Appendix A). These strike leaders recommended other strike leaders, creating a snowball selection. All strike leaders, except Lilly, were attending secondary schools in Aotearoa New Zealand during the 2019 climate strikes. Lilly attended an intermediate school during the strikes but was at secondary school at the time of the interview. Participants' ages at the time of the interviews ranged from 13 to 18. Parental/caregiver permission to participate in the study was gained for students under the age of 16. The gender balance, 11 females and four males, by coincidence, was representative of the gender balance found in climate strike movements internationally (de Moor et al., 2020).

When interviewed, the strike leaders were not asked directly what ethnic groups they identified with to ensure anonymity as they were a small group of students, many of whom knew each other well and were known to others. However, during the course of the interviews participants often drew on their cultural identities. For example, Oliana talked about her concern for close relatives living in the Pacific Islands. The interviews revealed three strike leaders identifying as Māori, one as Pasifika, one as born in Aotearoa New Zealand to parents who immigrated from China, one strike leader had immigrated from England when he was eight and another from Singapore when she was two. This information was considered during data analysis but not always included in the data to enhance the participants' protection from harm.

Geographically, the strike leaders were from a variety of urban or rural settings around Aotearoa New Zealand. Each attended different schools that ranged from decile five to ten (decile ratings identify the economic wealth of the community in which a school is located. Decile one indicates a low socio-economic community while decile ten indicates a high social-economic community. Funding is partially allocated to schools according to their decile rating with low decile schools receiving more funding). Further details on these participants are provided in Chapter 4.

The teacher sample consisted of eight teachers, some of whom were part of their school's senior leadership teams. The teacher interviews were timed to occur after the student interviews and, where relevant, enabled teachers to respond to the perceptions of strike leaders. While labelled the 'teacher' cohort for ease of description, as all participating teachers taught in classes during the time of the climate strikes, this cohort also included members of school senior management

teams - two were Deputy Principals and two were Heads of Departments. Convenience sampling was used for teacher participation. A request for teacher participation was advertised through closed social media education platforms, however, there were no volunteers. Potential participant teachers were therefore known to me or my colleagues and approached directly via email. If they agreed to participate, they were forwarded further information and consent forms (Appendix B).

There was no overlap between participating teachers and strike leaders, as all attended different schools. Two of the participating teachers worked together at the same school, the others taught at different schools from varying demographic communities in Aotearoa New Zealand. These communities included rural, urban, and area schools (Area schools are typically isolated, rural schools that cater for both primary and secondary students). Three participant teachers declared they had previous interest or experience in sustainability education and one taught climate change education as part of her science class. Four teachers stated they had little or no previous experience or knowledge of sustainability education or climate change education. Interviewing teachers who had little or no prior knowledge in this field of study was valuable, I believed, as it would add useful data by offering a greater, and perhaps more realistic, representation of teacher perspectives. The six female and two male teachers had expertise in numerous curriculum subjects including English, Drama, Graphic Design, Science, Social Sciences, and Te Reo. All the teachers interviewed were teaching in Aotearoa New Zealand secondary schools during the 2019 climate strikes. Further details on these participants are again provided in Chapter 4.

The teachers' semi-structured interviews were conducted via Zoom, also during the COVID 19 lockdown. Placing teacher interviews after the strike leader interviews allowed time for reconsideration of the teacher questions to ensure the questions aligned effectively with the emerging themes from the student cohort.

3.3.3 **Data generation**

The data generation was conducted in three stages. Firstly, the climate strike leaders' interviews (see appendix D), secondly, the teachers' interviews (see appendix E), and thirdly, the document analysis of media coverage at the time of the strikes. Zoom video conferencing and recording was used for all interviews. The length of interviews ranged from 45 minutes to 90 minutes and handwritten notes were taken during the interview. At the end of each student strike leader interview, keywords, concepts, and reflections gained from the interview were noted. The interview was then transcribed, verbatim, from the Zoom recording. This was

usually done within 24 hours of the interview. As the strike leaders' interviews progressed, thematic patterns emerged. The last few interviews, however, yielded minimal new content, suggesting data saturation (the point where no new themes are emerging from the data (Braun & Clarke, 2021)). The emerging thematic analysis of the strike leaders' data necessitated a review of the teacher's questions. Themes, such as, the high level of anxiety, and students' perceptions concerning the relevance of secondary schools were not part of the original teacher questionnaire design.

Stage two of the data generation involved interviewing each of the teachers. The teachers' questions were adapted slightly to better align with emerging themes from the strike leader interviews. Question 7 was added to the original questionnaire while questions 8 and 11 were adapted. The addition of question 7 reflected the emerging theme of rising levels of anxiety and the role anxiety has for climate action. The question asked, "the strike leaders I interviewed felt teachers, politicians, and adults generally do not understand the level of climate anxiety among youth. What are your thoughts on that?" Question 8 was extended with the addition of a pre-statement to fore-ground strike leaders' concerns as well as the literature on climate change education. It read, "the climate strike leaders also expressed concern at the apparent lack of climate change education in secondary schools. But an article in the *New Zealand Principal* mentions some outstanding practices in schools. What climate change education is offered at your school?" Question 11 originally questioned teacher perspectives on how the current educational system prepares students for their civic/political responsibilities as adults. Once again, I added a pre-statement to reflect strike leaders' comments. It read, "the student leaders interviewed felt empowered by the strikes, because they felt they were taking action and also because their understanding of political systems and processes improved. How well do you feel the current educational system prepares students for their civic/political responsibilities as adults?" These questions remained open but guided the discussion to consider strike leader's perspectives and thereby provided a teacher perspective of the emerging themes.

The length of teacher interviews ranged from 50 minutes to 90 minutes. Once again, notes were written during the interviews. Keywords, phrases, concepts, points of interest, or reflections derived from the interview were noted at its conclusion. Each interview was then transcribed by replaying the zoom recording and typing, verbatim, onto a Microsoft Word document.

The third stage of data collection, document analysis, was conducted once the interviews were completed and had been preliminarily thematically coded. The document analysis of online media news from around the time of the strikes was considered relevant as they reported the

varying perceptions, activities, and comments of strike leaders, politicians, and educators at the time of the strikes. Because of the considerable extent of the global and national publicity, analysing media documents provided a means to triangulate the interview data and add valuable insight into a wider range of public and youth perceptions. The online media documents were sourced from nine media platforms: *Radio NZ, TVNZ, Newshub, Māori TV, Newsroom, NZ Herald, Stuff, The Spinoff,* and *The Guardian*. Further justification for my choice of documents and process is outlined below in Section 3.3.5, the document analysis section. Document analysis of online Aotearoa New Zealand media news was used alongside the interview data. This tool was analysed in consideration of the developing thematic analysis, and document analysis provided an opportunity to triangulate relevant interview data.

3.3.4 **Interviews**

The interview is considered an effective tool when collecting data from a small population sample, with effective implemented, it is considered a powerful research technique allowing participants the opportunity to contribute rich detail around complex issues. The interview process has been compared to a conversation with purpose and enables participants' narratives and personal stories to emerge (Cohen et al., 2018; Slayton, 2018). Using the interview method to generate data is valuable for a critical theory approach as it goes beyond describing a phenomenon and starts to consider the reasons *why* the individuals think, act or behave in certain ways. This facilitates extended understanding of processes, social actions, and cultural meanings (Kvale, 1996). Many strike leaders and teachers expressed appreciation at being given a vehicle in which they were able to share their views and lived experiences of the climate strikes and climate change education.

The richness of the data, however, depends on the calibre of the interview questions. The interview questions for this study were influenced by my curiosity and an epistemological belief in the transformational role education can play in society (Goodman, 2014; Irwin, 2020) A review of the literature further encouraged consideration of youth perspectives and the possibility of formal education to help achieve the needed shifts in societal attitudes and behaviours. While research suggests climate change education is gaining momentum, the tools offered to guide pedagogical efforts and in the process aim to ease the increasing levels of eco-anxiety *are lacking* (Bolstad, 2020a; Hickman, 2020; O'Keeffe, 2021, April 19; Verlie et al., 2020). That said, we know that consulting students has shown to expose articulate and insightful perceptions of pedagogical practise (Cook-Sather, 2018; Mansfield, 2014) and enhanced an understanding of student needs, thus improving educational efficacy.

The interview format was semi-structured and, for this research, consisted primarily of open questions (Cohen et al., 2018). The semi-structured nature of the interview allowed comparability between participants and flexibility as well as facilitating organisation of data. Follow-up probing questions enabled clarity or deeper exploration when warranted. The semi-structured interview format with open-ended questions was preferable over an unstructured format as it encouraged interviewees to answer questions freely and openly on their terms but also provided a framework that enabled data generation to align with the research questions. The semi-structured format provided the 'best fit' for this research as it offered rich and detailed data within a consistent framework while allowing plasticity when needed (May, 2011; O'Leary, 2017). This flexibility enabled the emergence of unforeseen data, such as the themes suggesting the high levels of youth anxiety, and youth frustration with older generations, to emerge.

The strike leaders were asked 19 questions and the teachers were asked 12 questions. The questions for both cohorts aligned with the key research questions to clarify the research trajectory and connect the field of study with the research purpose (Agee, 2009).

The interview questions for the teacher cohort, while similar, were adapted to reflect the different experiences and professional obligations of the teacher cohort and the emerging themes from the strike leaders' data. The questions were constructed to lead the participants from reflecting on their personal experiences of the climate strikes and how the experiences with youth strikes may have connected with classroom education, to identify future possibilities. As a secondary school teacher, I was familiar with the culture of Aotearoa New Zealand secondary schools and, where necessary, asked further questions to enhance clarity and understanding. The final question asked if there was anything else they would like to say. This question often yielded unanticipated responses and valuable data, arguably, a hallmark of qualitative data collection. *Table 3.3.4* identifies the connections between the interview questions, reviewed literature, and the research questions.

Table 3.1

Interview question links to the research questions, theory and literature

Research questions

1. Why now? What has motivated and engaged students to take climate change action?
2. Does participation in the climate strikes influence understanding of climate change and motivate action?
3. What are student and teacher perceptions of educational outcomes for youth who participated in the climate strikes?
4. What are the implications for future climate change educational practice?

Strike leaders' interview questions	**Teachers' interview questions**	**Theoretical connection**	**Link to research question**
1. Tell me about your role in the climate strikes.	1.Tell me about your experiences with the climate strikes?		General background information to put answers in context
2. How and why did you become involved? Supportive family? Supportive school?	2. What was your school's stance towards the climate strikes? How did you feel about that?	Youth have been politically marginalised and consider themselves passive social actors (Gordon, 2010) Youth may be uncertain but may persist because of a motivation to change history (Morrow, 2016) Parents contribute significantly to the values, attitudes, and behaviours of youth (Lawson et al., 2019)	Why now? What has motivated and engaged students to take climate change action?
3. Why do you think students were motivated to strike? What influence do you think Greta Thunberg or a similar roll model has?	3. Why do you think students were motivated to strike?	Cultural norms and social networks are key motivators (Owens & Drifill 2008) CC action driven extrinsically or intrinsically. (Ryan & Deci, 2000)	Why now? What has motivated and engaged students to take climate change action?
4. What do you think influenced students most, their peers, or the issue of climate change?	4. What do you think influences students most, their peers, or the issue of climate change?	Engagement is a manifestation of motivation. A strong correlation between students' engagement and learning outcomes (Christenson, 2012)	

		Students sense of identity interweaves with their learning experience (Bell et al., 2017)	
5. Why do you think many students chose not to strike?	5. Why do you think many students chose not to strike?		Why now? What has motivated and engaged students to take climate change action?
6. Where do you think students mainly get their information about climate change from?		Most secondary schools are currently *not* engaging students in climate change education (Bolstad et al., 2015) Politically active youth are frequent users of social media (Valenzuela, 2013)	Why now? What has motivated and engaged students to take climate change action?
7. Do you think climate change should be taught in schools? If so, how?		Improving understanding of student engagement is a prerequisite to improving classroom efficacy (Cook-Sater 2018, Cowie et al 2012)	Does participation in the climate strikes influence understanding of climate change and motivate action?
8. Were the climate strikes a learning experience for you? What do you think you learned?	6. What do you think educators can learn from the climate strikes?	Climate action is thwarted by discrepancies between knowledge, attitudes, and behaviours (Kollmuss et al, 2002, Ojala, 2012.	
9. Do you think participating in the climate strikes was a learning experience for other students who were not leaders?	7. The climate strike leaders I interviewed felt teachers, politicians and adults generally do not understand the level of climate anxiety among youth. What are your thoughts on that?	The key competencies are needed to live, learn, and work and to contribute actively to the community… successful learners make use of the competencies (Ministry of Education, 2007b).	Student and teacher perceptions of educational outcomes for youth who participated in the climate strikes.?
10. The *New Zealand Curriculum* identifies five key competencies that are considered important. Thinking, using language and symbols, managing self, relating to others, participating, and contributing. Do you think students developed	8. The climate strike leaders also expressed concern about the apparent lack of climate change education in secondary schools. But an article in the *NZ Principal* mentions some outstanding practices in schools. Can you tell me what climate		Student and teacher perceptions of educational outcomes for youth who participated in the climate strikes.?

any of these by participating in the strikes? *The key competencies were written on a card and shown to strike leaders to help them consider their answer.*	change education is offered in your school?		
11. Has participation in the strikes helped you believe you can bring about change? What about other students?	9. The strike leaders felt empowered by the strikes because they were taking action and also because their understanding of political systems and processes improved. How well do you feel the current educational system prepares students for their civic responsibilities as adults?	Political and environmental literacy are entwined (Brocklehurst, 2015) Ethical transformations require an understanding of political forces (Beals & Wood, 2012., Lowe, 2002)	Student and teacher perceptions of educational outcomes for youth who participated in the climate strikes.
12. Do you think the climate strikes had any impact on the Zero Carbon Act or other governmental decisions?	10. Do you think schools should take a role in supporting students to take action on issues of concern for them? Why/why not?	Even temporary action and small groups of collective actors can have a powerful effect on governments (Richter, 2011)	Student and teacher perceptions of educational outcomes for youth who participated in the climate strikes.
13. How do you feel about the governmental and public response to COVID 19 compared to their response to climate change?		Collective action requires not only social networking but also a shared understanding (Richter, 2011) In times of uncertainty and change, motivation is required to make meaning of important social events and reshape politics (Morrow, 2016)	Implications for future climate change educational practice
14. What more could be done to encourage climate action?		The thinking that leads to youth activism is often alternative to or decades ahead of adults' perspectives (Berryman et al., 2013)	Implications for future climate change educational practice

15. Do you think the students will continue to strike in the future if nothing happens?		For many youths, participating in politics can be a disempowering experience (Beals & Wood, 2012) Youth have been politically marginalised, they consider themselves as passive social actors, unable to instigate significant social change (Gordon, 2010)	Why now? What has motivated and engaged students to take climate change action?
16. What would you hope educators can learn from the climate strikes?	11. What would you like to say to the climate strike leaders or youth who have genuine concerns for their future?	Secondary schools have changed less over recent decades than the students they serve (Kane and Maw 2005) Classroom conditions and pedagogies that promote student engagement with CC require further investigation.	Implications for future climate change educational practice
17. What climate action would you like to see happen next?		Studies have confirmed student consultation has exposed articulate and well-formed views from learners regarding their classroom conditions, providing an impetus for developing pedagogies (Kane & Naw, 2005, Nelson 2015)	Implications for future climate change educational practice
18. What does the future hold for you?		Knowledge alone does not necessarily motivate behavioural change (Monroe et al., 2017) The key to climate change education is to enable students to explore links between their personal lives, the wider environment and make connections with social and economic concerns.	Student and teacher perceptions of educational outcomes for youth who participated in the climate strikes
19. Is there anything else you would like to say?	12. Is there anything else you would like to say?		

The questions and the format of the questions were piloted with two separate interviews. The strike leader interview was piloted with an 18-year-old student and the teacher interview was piloted with an adult. The pilot interviews aimed to assess the language, flow, and timing of the interview (Ahlin, 2019). As a result of the pilot interviews, minor adaptations were made to the wording of questions to simplify language and improve the clarity of meaning. Two significant changes occurred. Question three in the strike leaders' interview was adapted to include a direct reference to Greta Thunberg and to ask about the perceived influence she may have had as a role model. The second change, for question ten, involved the recommendation to provide a visual list of the five key competencies for strike leader participants to read. Both these suggestions were incorporated into the final interview questions.

Semi-structured interviews may risk the perceived trustworthiness of the data as, inevitably, the researcher is prone to bring their own experiences, characteristics, knowledge, and prejudice to the interview and its interpretation (Chenail, 2011; Cohen et al., 2018). A possible weakness of using semi-structured interviews was the potential for confirmation bias, where the researcher may structure questions and favour information that supports previously held beliefs (Silverman, 2016). However, qualitative research is not a neutral process (Coe et al., 2021) and while the research may aim to be neutral, prior experience and knowledge may offer valuable insight. Nevertheless, the research design must demonstrate reflexion to ensure rigour in the chosen methodology. Reflexivity acknowledges that the researcher is inescapably entangled with the social world they are exploring, and part of the research process is considering how their 'positionality' may impact their research.

The ontological basis for this research was the need for climate action and this bias was communicated to participants in the introductory letter when explaining the rationale for my research and again during the opening stages of the interview as I explained the background for this study. The semi-structured interviews enabled a structured but open conversation on each question. I attempted to remain neutral during the interviews by offering general affirmations to all comments, maintaining a level tone of voice throughout the interview, and keeping extraneous comments to a minimum. When the need arose to ask probing questions, I used short open-ended questions in an attempt to seek clarity or depth. The emergence of key themes that were not anticipated or reflected in the questions indicated the openness and plasticity offered by the semi-structured interviews.

The semi-structured interview format often fostered deep reflection from participants. This reflection sometimes led to candid comments, such as two teachers acknowledging the importance of climate change education but saying they were ashamed they had not thought much about it before this interview. For some of the strike leaders, this reflection exposed a vulnerability as they recalled the emotional journey that led to them becoming climate strike leaders. I responded empathically by acknowledging that this was a complex and challenging issue and asked if they wanted to say more or would rather move to the next question. I was cognisant of the balance between gaining rich data and the ethical need for participants to feel safe if they were to reflect and disclose experiences that may have led to feelings of discomfort. The interview questions and my responses aimed to minimise their levels of discomfort and at no stage during the interviews did any participant show discomfort.

The use of Zoom video conferencing provided an accessible online platform for interviewing participants who were located in different parts of the country and were confined to their homes because of COVID-19 lock-down mandates. Face-to-face interviewing is considered reliable for qualitative data generation due to the personal and physical interactions needed to build rapport (Khalil & Cowie, 2020). However, research that explores the benefits and challenges of video conferencing is expanding. Video conferencing platforms, such as Zoom, have been found to overcome time and financial constraints. Interestingly, Deakin and Wakefield (2014) suggested that building rapport can occur more quickly with video conferencing compared to face to face interviews, particularly if email communication has occurred prior to the interviews. They also asserted that participants may be more expressive and open with video conferencing.

The convenience of video conferencing was advantageous for this research and possibly yielded richer data. I observed strike leaders comfortably positioned in their bedrooms (sometimes with a backdrop of posters or homework schedules) and rapport was often created relatively quickly with a short pre-interview conversation around lock-down experiences. It occurred to me that this interview environment, with a lack of time constraints and familiar environment, was potentially more comfortable and conducive to conversation for the participants than having to travel and be interviewed in a neutral location.

The challenges associated with Zoom may include technical difficulties (Gray et al., 2020), however, lockdown necessitated a reliance on video conferencing for many people and the participants were familiar with the technology which resulted in no difficulties during the data collection process. The Zoom recording capacity enabled each interview to be saved automatically to my computer and facilitated the process of accurate, verbatim, transcription.

Immediately after the interview I studied the notes taken during the interview and observed emerging patterns, creating an informal audit trail of my observations. I added to these notes during the transcription process which involved typing the interview onto a Microsoft Word document. The emergence of repetitive keywords and themes that aligned with research questions contributed to the development and nuance of developing NVivo codes. The full verbatim transcript of the interview was emailed back to the participants allowing them two weeks to review their transcript, accept it, edit it, or choose to withdraw from the study. There were no withdrawals, one strike leader and two teachers made minor edits to their transcripts. The transcripts were then uploaded into NVivo 12 qualitative analysis software (QSR International Pty Ltd, 2018).

The interview process supported a critical theory approach by facilitating the questioning and understanding of the prevailing phenomena through the eyes of those closest to the action (Cohen et al., 2018). The semi-structured on-line interviews provided a platform for the strike leaders from diverse geographical areas to critically evaluate and express their views on climate change education, climate action, and societal transformation. The use of NVivo provided a tool for classifying and arranging the data as well as providing analytical support with identifying themes and emerging patterns.

3.1.1 **Document analysis**

Document analysis requires data selection rather than data collection and was chosen as a qualitative research technique to triangulate and contextualise the interview data, offering another layer of insight and meaning (Hartas, 2010; McCulloch, 2004). Document analysis is a systematic procedure that finds, selects, appraises, synthesises, and evaluates data from primary, secondary, and tertiary documents (Bowen, 2009). Digital documents were chosen from key media platforms and because of their medial coverage of the 2019 climate strikes. They were systematically evaluated by aligning the document data with relevant thematic areas.

Using online news media sources allowed for overt or latent political and societal values and attitudes to be indicated and trends identified (Wallen & Fraenkel, 2001). The digital news media documented the social context by offering insights into the media's perceptions and projections of the students' motivation, political opinions, and experiences at the time of the strikes. These primary sources reported journalists' experiences directly from the strikes, offering a historical context and relaying the action and comments of many other strike participants. Some media stories were opinion pieces written before or after the climate strikes

by students, scientists, or politicians. Of interest for this research was not only what was reported by the media about the climate strikes, but also, what may have been neglected by the media coverage (Bowen, 2009).

A methodical selection and analysis of the 2019 digital news media coverage of the climate strikes were juxtaposed with the strike leader and teacher interviews to add depth to the data and mitigate researcher bias. Researcher bias may reduce credibility if the choice of documents are not sufficiently representative or lack objectivity (Cohen et al., 2018), however systematic selection can offer useful insight and multiple perspectives on a single issue or phenomenon (McCulloch, 2004), such as the climate strikes. The documents, totalling 60, were systematically selected with consideration of the 2020 snapshot report published by the Auckland University of Technology (AUT) research centre for Journalism, Media, and Democracy (JMAD). This snapshot reported a survey of media news outlets in Aotearoa New Zealand identifying what they considered the most trusted media news sources (Myllylahti & Treadwell, 2020). I selected document sources from media brands that received a score of six or above (from a scale of 1-10). These sources included *Radio New Zealand*, (6.8) as the most trusted media source, followed by *Television NZ* (6.6), *Newshub* (6.3), *Māori TV* (6.3), *Newsroom*, (6.2), *NZ Herald*, (6.2), and *Stuff* (6.0). I also included two other sources, *The Spinoff* (5.2) because this was the media source (along with *Stuff*) that was identified by strike leaders as a source youth are most likely to use, and the localised version of the *Guardian News* website. Google search was the online engine used to identify suitable documents. For an initial broad search, the keywords 'climate strikes 2019 New Zealand' were used and the data were recorded. The next stage involved targeting specific media news brands by including the brand name in the search, for example, 'climate strikes 2019 New Zealand, the *Guardian News'*. This refined search produced more numerous results for most of the media sources. Every media news article from these brands that discussed the 2019 climate strikes was catalogued and included in the data selection.

The process and analysis of the data selection from each source involved an initial reading of the article to identify its significance in contributing salient information that related to the themes derived from the interview data. Many articles were repetitive and simply reported general information about the global movement, Greta Thunberg, and the protest activities of the day. Data pertinent to comments or perceptions of strike leaders, youth strikers, students, indigenous groups, educators, and politicians were cut and pasted onto a table (see Appendix F for a shortened version of the table), along with the media source, date, relevant quotations, and thematic connection. The table was uploaded into NVivo software analysis programme

(QSR International Pty Ltd, 2018) and coded accordingly into the NVivo themes. This new data necessitated the addition of two codes, adult support, and adult scepticism.

The addition of these codes reflected the supplementary data and perceptions of the document analysis of the media coverage provided for my research (Elliot et al., 2016). Analysis of the media documentation methodologically triangulated youth and adult perspectives by comparing and contrasting the interviewee perceptions with those reported in the media (Patton, 1990), it thereby tested trustworthiness by conflating different sets of data. This process offered greater credibility to the data analysis.

3.4 **Data analysis**

Qualitative data analysis, by its very nature, is an inductive process. The theory arises from the data as the researcher reads, reflects, interprets, and infers (O'Leary, 2017) and in doing so, makes sense of the data. For this research, the process involved; data generation and collection, organising raw data, coding and entering data, analysing thematically, interpreting data, searching for meaning, and finally, uncovering the implications of the data. The preliminary analysis in this research intuitively centred around the guiding questions. This initial deductive process enabled a framework to be established that reflected the research aims. As each interview was transcribed, I added to initial notes on key or repetitive words and emerging themes, aligning the themes with my guiding questions. I was cognisant that this process subjectively identified what was considered relevant data as it connected to the predetermined questions (Hartas, 2010). Subsequently, however, patterns emerged, themes were developed and refined with analytical support from NVivo software (QSR International Pty Ltd, 2018).

Critical analysis demanded a process of probing, scrutinising, evaluating, and connecting similar and disparate findings, to identify salient themes, insight, and meaning (Charmaz, 1996; Finfgeld-Connett, 2018). My analytical process was iterative and reflexive, to enhance the critical analysis. This was done by using iteration, a repetitive and systematic revisiting of the data by which I reread each thematic code, took notes, and made connections between and within themes. I utilised the NVivo Explore function to create word clouds, determine word frequencies, text search, and matrix coding queries, and this process helped identify new connections and deepen my understanding.

Reflexivity involved frequently questioning to decide whether the data offered useful insight to my research questions and if that insight contributed value to climate change education and classroom pedagogical practice. I also questioned what was missing from the data. Srivastava and Hopwood (2009) recommended the researcher regularly asks and reviews what the data

are saying as well as considering what the dialectical relationship is between the research questions and the data. As the researcher, I have not just reported the findings but have questioned and analysed the framework that has been used to construct the findings (Mortari, 2015) as well as reflected on gaps in the findings. I also reflected on how the thematic analysis and selection of data represented the views of the participants. Authentic portrayal and interpretation of participants' voices have been an integral consideration for this research.

The qualitative data in this research were augmented by a small amount of quantified data. Statistical analysis of frequency, in a small sample, enabled a preview of concepts, perspectives, and themes that underpin the key research areas. (Boone & Boone, 2012). Quantifying data was used in this research to inform a priority list of themes and gave weight to participants' preferences, such as, the number of strike leaders and teachers who identified a particular motivational area or social media platform. Qualitative data, however, ensured the theory arose out of the data to go beyond description, reflecting, interpreting, and inferring (Cohen et al., 2018). Deeming what was important was a subjective process as it required interpretation of the participant's world to inductively make meaning from the data (Braun, 2013). However, the initial themes for this research were deductively framed around the research questions.

The inductive process grounded the data in participants' voices. The combination of small-scale quantifiable data and a qualitative research process was utilised to increase analytical rigour with the development of themes and during the research process (Boyatzis, 1998; Fereday, 2006).

3.4.1 **Thematic analysis**

Thematic analysis can generate rich data and highlight similarities, disparities, as well as generate unanticipated insights (Maguire & Delahunt, 2017; Nowell et al., 2017). The flexibility of thematic analysis catered to the needs of this research by enabling the data to be aligned with the research questions as well as ground the data in participants' perspectives. The use of semantic and latent analysis helped to identify these themes (Braun, 2013). The semantic analysis, such as the initial identification of key words, was helpful for considering the surface, explicit and obvious meanings of the data. The latent examination considered the underlying assumptions and ideas behind the data that emerged from comparing individual interviews, the separate cohorts and the document analysis. The volume of qualitative data generated from the interviews and document analysis encouraged a focus on thematic analysis that aligned the data and gave insight into the research questions (Hartas, 2010).

The thematic analysis followed the steps outlined by (Braun, 2013), but while these are presented as a linear method, the process, as previously discussed, was more iterative and reflexive (Nowell et al., 2017). The six steps included: familiarity with the data, generation of initial codes, a preliminary search for themes, review of themes, modifying themes, development and defining themes, considering what they identify before finally writing up the report.

I gained familiarity with the data while transcribing the interviews. The research questions instigated the generation of the following initial codes:

- Student motivation
- Increased understanding of climate change
- Learning that reflected the *New Zealand Curriculum's* key competencies
- Teacher perceptions of the educational outcomes
- Environmental literacy
- Political literacy

A verbatim transcript of each interview was uploaded to NVivo analysis software. The transcripts were read again and reviewed for commonalities that led to modifying and refining the themes. If there were not enough data to support a theme or the data were too removed from the research questions, it was not coded. This led to the generation of 12 codes. Themes were initially explored using NVivo word clouds to give a visual representation of the frequency of words. On-going review of the data generated a further nine sub-codes. *Table 3.4.1* outlines the refined themes (in alphabetical order as they were formatted on the NVivo software), sub-themes, and word frequency for each theme.

Table 3.2

Refined themes with NVivo software

NVivo code	**Thematic Description**	**Sub-codes**	**Word-cloud word frequency**
Barriers	Explored the perceived barriers to climate change education in secondary schools.		Curriculum Teach Wrong
Climate anxiety	Explored the manifestation of climate anxiety and the impact climate anxiety had on	Hopelessness Motivation	Generation Anxiety Future

	motivation and student wellbeing.		
Diversity	Explored the diverse cultural representation of climate strikers in Aotearoa New Zealand climate strikes. Were they representative of the population?	Lack of diversity	Involved Pasifika Different
Empowered	Explored actions and experiences that resulted in feelings of empowerment for youth. Education has the potential to liberate and empower students or shackle them.	Student voice Political agency Challenging authority Making a difference Empowering experiences	Power Difference Action
Message to educators	Explored students' unique and important perspectives regarding school and classroom-based practice.	What is happening in schools	Teach Important Actually
Motivation	Explored the driving forces behind youth strike participation and climate action. Was student motivation extrinsically or intrinsically based? Explored adults' perceptions of what motivated youth.	Friends or issues? Why do students choose not to strike?	Involved Environmental Friends
New Learning	Explored new learning gained from strike participation and if it was self-directed, guided, modelled, personally relevant, active, passive, interactive, etc?	Action that is taken as a result of new learning	Skills Learned World
Pedagogy	Pedagogy promotes student learning and is considered at the core of effective classroom teaching and learning. Without a student's voice, the pedagogical picture can be considered incomplete.	Key competencies	Teach Curriculum Different
Political literacy	Explored how the climate strikes increased	Teaching political agency	Power

	youth political literacy. Political literacy offers students a historical perspective and understanding of political, social, economic, and environmental connections. Increased understanding is vital for developing values and skills needed in political decision-making.		Action Political
School support	Explored the role schools played in supporting or discouraging participation in the climate strikes and the implications of that support (or lack of).	Leadership	Supportive Involved Principal
Social justice	Explored understanding of social justice concepts that place the rights of humans and more-than-human species at the centre of climate change action.	Indigenous knowledge	Indigenous Economy Transition
Teacher actions	Explore the significance of teacher actions and interactions that engage climate action.	What is happening In schools	Issue Actually Different

The transcripts were coded line by line, reflecting the participants' words and the news media text. In some cases, the text chosen from the interviews was coded into more than one theme. The NVivo Explore function was used to semantically assess the data combined with a manual iteration of the texts. This involved repeatedly mining each code by reading, re-reading, and taking notes to explore the latent messages in the data. Consideration of the data included an appreciation of the social context from which the data arose and enabled connections, similarities, links, and contradictions between and within cohorts to appear. Analysis with a critical lens considered how an individual's interaction with their environment and experiences of social and political constraints or expectations may have impacted their understanding (Howell, 2016; Lincoln & Guba, 2016).

Making sense of the data was further enhanced during the process of writing papers for publication. As I collated and presented the data thematically to a critical audience, new

connections and understanding emerged. Publication of my research enhanced nuanced consideration of interconnectivity between meaningful themes and the relevance or application those themes may have for both educational research and climate change education. Thematic analysis allowed flexibility within the analytical process, but methodological rigour was required to ensure the research was transparent and trustworthy.

3.5 **Trustworthiness**

In qualitative research, trustworthiness can be seen to be equivalent to validity and reliability to demonstrate that the data and subsequent findings were rigorously obtained and accurately portrayed the phenomenon being researched (Nowell et al., 2017). In qualitative studies consideration of the four criteria established by Guba and Lincoln (1994), including credibility, transferability, dependability, and confirmability are recommended (Shenton, 2004).

Credibility measures the congruence of findings with reality and considers whether the constructed realities of the participants are authentically represented (Coe et al., 2021). In this research I ensured the data directly reported the spoken words of youth climate strike leaders and teachers. The teacher interviews offered a different perspective of the same phenomenon, while the media reports provided a third perspective, triangulating the strike leaders' and teachers' perspectives. Member checking involved returning the transcripts to the participants to ensure the transcripts fully represented the participants' perspectives and their interviews. One teacher and one student choose to edit their transcripts before returning them. As an experienced secondary school teacher, I was familiar with Aotearoa New Zealand classrooms and secondary school culture from which many of the participants' perceptions and experiences were derived. Interpretation of the transcripts was drawn from analysis of participants' words and conceptual thoughts to form contextually based themes. The data interpretation and thematic analysis were peer-reviewed by colleagues and by my doctoral supervisors. A growing body of international research literature supports and aligns with the findings from this research indicating the findings are congruent, not just with Aotearoa New Zealand, but also internationally.

Transferability considers how easily the findings can be generalised to other contexts, although the aim is not to generalise from the findings. The rich, detailed data gained from the semi-structured interviews enabled observation and interpretation of youth action in the climate strike context. Despite similar findings being reported by international research, the small sample from this research suggests findings cannot be generalised beyond Aotearoa New Zealand's climate strike leaders. The data collection, however, was derived from a

geographically and ethnically diverse spread of participants and the interviews were deemed to have reached saturation point. This combined with data from the document analysis implies that these findings may be representative of the climate strike leaders' perceptions (who were also secondary school students at the time of the interviews) in Aotearoa New Zealand.

Dependability concerns the methodological detail and reflexivity displayed in the research design and implementation. Presenting an audit trail helps to verify the plausibility of the researchers interpretations of the data collection, analysis and interpretation (Coe et al., 2021). My research design ensured consistency of data collection by utilising Zoom video conferencing and recording for all interviews, verbatim transcribing of interviews, and the utilisation of NVivo software analysis programme. The full transcript for each interview was considered in the initial analytical process to determine thematic codes and document analysis triangulated the interview data. The data were reviewed regularly at different stages of data analysis, regular note taking, and mind maps were used to log my perceptions and reflections. These steps combined with continual discussion with my peers and supervisors provided a reflexive data analysis practice.

Confirmability considers the objectivity of the research process and if the research actually measured what it intended to measure (Golafshani, 2003). Ontologically, I have identified my belief in the need for high levels of climate change literacy within the population, and this research sought to question how we can improve motivation and pedagogy within the secondary school context. While focusing on strike leaders' perceptions, the research design allowed the voice of students and teachers to be heard. To this end, the themes and subsequent findings resulted directly from the participants' perceptions and suggestions. The emergence of unanticipated themes confirms the findings went beyond any researcher bias to accurately represent the experiences and voices of the participants.

Data analysis is the most complex phase of qualitative research and must therefore be approached systematically, transparently, and be clearly communicated (Nowell et al., 2017)). By adhering to the four constructs (credibility, transferability, dependability, and confirmability) recommended by qualitative researchers Guba and Lincoln (1994), this research demonstrates a high level of trustworthiness.

3.5.1 **Ethics**

Ethical approval was granted for this research by Te Kura Toi Tangata Division of Education Ethics Committee on November 27th, 2019 (see Appendix C). My ethical obligations extend to ensuring the research process was conducted to the best of my ability, was culturally

respectful, and worthy of the time given by individual participants, the academic community, and the wider community. To ensure there was no pressure for individuals to participate, potential strike leader participants were initially approached casually through social media. In some instances a strike leader recommended other strike leaders and arranged contact through email. Two strike leaders who were approached via social media, did not respond, so I did not pursue their participation further. The teachers were approached via email and all who were approached agreed to participate. Once participants confirmed their interest they were emailed a more detailed explanation of the research aims, processes, and a consent form (Appendix B). Participants signed and returned the consent form showing they understood the purpose and conditions of the research, a cornerstone of respectful research relationships (Graham et al., 2015). Participants under the age of 16 required evidence of informed parental permission before being interviewed. Transparency regarding the epistemological position that underpinned the aim of the study was identified both in the introductory letter and the opening interview statement. Reflexivity included frequent consideration and checking for personal bias and deliberation over the potential political and educational ramifications (Roth & von Unger, 2018) of research that focused on the need for transformational shifts in education and society. To mitigate personal bias the verbatim transcription of interviews aimed to maintain the integrity of individual perspectives and thereby authentically ground the findings in the participants' voices.

The key ethical principles, according to Braun (2013), are *respect, competence, responsibility, and integrity*. Included in the principle of respect is the consideration of individual rights, cultural respect, and power dynamics.

The individual rights consist of transparency with research motivation, methodology, and research publication for all participants. Participants had the right to withdraw from the research up to the time they had sighted their transcript and then agreed on the inclusion of the transcript as data. The participants' identities remained confidential through the use of pseudonyms. While most strike leaders' names had previously been published in the media, anonymity for both strike leaders and teachers allowed for a greater level of disclosure around their schooling experiences.

Cultural respect ensures respecting differences (Miller et al., 2012). Aotearoa New Zealand is a culturally diverse country, and the participants reflected this cultural diversity. The predominant cultural influences in Aotearoa New Zealand are European and Māori (the indigenous culture). The shared understanding of key Te Reo (Māori language) words and mātauranga Māori (Māori knowledge) comes from my teaching and living experiences in

Northland where 33% of the population (the region with the second-largest Māori population in Aotearoa New Zealand) identify as Māori (Northland Regional Council, n.d). Cultural respect was identified in the introductory statements of the interviews by stating that the focus of my research was to listen, respect, and find meaningful application with the diverse voices of strike leaders and teachers (Pelzang & Hutchinson, 2018). The open-ended questions provided room for participants to reflect and answer any way they felt was culturally relevant.

Power dynamics as an ethical consideration includes the relationship between the researcher and participant. It is not only ensuring mutual respect between the researcher and the participants but also a consideration of authority over knowledge and the value of that knowledge (Miller et al., 2012). As a researcher and teacher, positions traditionally considered authoritarian, the power dynamics had the potential to make the strike leaders feel uncomfortable. However, the strike leaders were the ones holding the knowledge and the strike leaders (based on the information I had given them about the research) trusted that I, as a researcher, sought to explore their perspectives and actions. Additionally, I aimed to build rapport with each participant before the formal interview commenced by initiating a light discussion around Covid lockdown experiences. Barriers were further eased by the participants' settings. Zoom conferencing from their home enabled a casualness that is less likely to occur in face-to-face interviews (Deakin & Wakefield, 2014). The teacher participants regarded me as a colleague and the semi-structured interviews facilitated a conversational atmosphere.

Competence was demonstrated by adhering to The University of Waikato's ethical conduct guidelines that reflect common-sense practices of respect, cultural awareness, and a commitment to the sharing and learning of knowledge (The University of Waikato, n.d). As the researcher, and with the support of my supervisors, I ensured I stayed informed about ethical practices and remained cognisant of my own level of competence. As a registered teacher I was also committed to the ethical responsibilities outlined in *Our Code, Our Standards (Teaching Council of Aotearoa New Zealand, 2022).*

Responsibility to the participants and society as a whole included transparency with the methods and data analysis to guarantee the process was ethically reliable (Wasserman, 2013). Participants had the opportunity to validate their transcripts as being representative of their interviews and perspectives. Participants have been notified of published work and they will be sent a summary of the completed thesis.

Integrity ensures the research is conducted in a way that engenders trust and confidence in the research process. This includes the safe storage of the data and accurate representation of the latent emerging themes (Sanjari et al., 2014). The data for this research are stored on a password-protected computer and in the NVivo cloud (also password protected). Culturally, the integrity aimed to ensure the outcomes were representative of the diverse participant perspectives and that the findings were meaningful to participants, students, educators, and the academic community (Pelzang & Hutchinson, 2018).

3.6 Chapter summary

Valuable educational research in the twenty-first century should use robust, fit for purpose, research practices that go beyond the researcher's needs and serve the well-being of people (Hostetler, 2005), and in the context of this research, I would argue, the biosphere. As awareness and concern around the climate crisis increases, qualitative research of this nature could now be considered not only an academic and political exercise but also an ethical pursuit. The conceptual framework for this research is grounded in critical theory as the ontological premise is based on the need for systemic change. The interpretive framework and critical lens epistemologically considered the interaction of experiences and perceptions of young strike leaders and secondary school teachers. Using thematic analysis, supported by NVivo analysis software, the semi-structured interviews of 15 strike leaders and eight teachers were triangulated with document analysis from Aotearoa New Zealand online media articles that were written about the 2019 climate strikes.

Data analysis required a systematic approach to maintain the integrity and efficacy of this qualitative research. Through a reflexive and iterative process, I critically scrutinised and evaluated the data to connect and consider emerging themes that were representative of the participants' voices. Themes emerged indicating strike leaders' concerns and pedagogical links that may increase educators' understanding of how best to engage and motivate students in the classroom - towards climate action.

Trustworthiness was demonstrated based on the criteria established by Guba and Lincoln (1994), that of credibility, transferability, dependability, and confirmability. Ethical conduct ensured my methodological process adhered to the University of Waikato's ethical conduct guidelines and reflected common-sense practices. This process facilitated a research design that supported outcomes that were meaningful and an authentic representation of participants' perspectives. These outcomes are presented in the following chapters.

Chapter Four: Findings - the *why*

4.1 Introduction

This chapter presents findings that have been drawn from climate strike student leader interviews, teacher/senior school management interviews and document analysis of Aotearoa New Zealand online media news platforms that indicate *why* strike leaders were motivated to take action. Contextual information about participants precedes thematically presented data. The findings are introduced in thematic areas that represent the reasons behind students motivation and engagement, and also considers why students may have chosen not to participate in strike action.

4.2 Background of participants

All participants in this study were either full-time studying or teaching in Aotearoa New Zealand schools at the time of the climate strikes. The participants span a range of ages, ethnicities, rural and urban locations, environmental interests, and political interests.

4.2.1 Context of student climate strike participants

The student participants were initially identified through media publications regarding the climate strikes in Aotearoa New Zealand and approached using social media. They, in turn, recommended other climate strike leaders from around Aotearoa New Zealand. All, except Lilly, were secondary school students during their time as climate strike leaders. Lilly was an intermediate school student. The following table summarises some contextual information about the climate strike leaders interviewed for this research. The school support column identifies the level of support school leadership offered strike leaders during the climate strikes. Whānau is a Māori concept that refers to family.

Table 4.1

Student climate strike participants contextual data

Pseudonym	Age	Male/female	School support	School Decile	Parental/ Whānau (family) support

Aroha	16	F	Some support	5	Yes
Catherine	16	F	Yes	7	Yes
Flora	15	F	No	7	Yes
Huia	16	F	Some support	7	Yes
Jake	17	M	Yes	8	Yes
Josh	19	M	No	9	Yes
Lajos	18	M	Yes	8	Yes
Lilly	12	F	Yes	9	Yes
Madison	18	F	Some support	7	Yes
Marama	18	F	Yes	8	Yes
Mary	18	F	Some support	9	Yes
Moana	18	F	Some support	9	Yes
Oliana	18	F	No, threatened with suspension a few times.	7	Yes
Simon	17	M	Yes	6	Yes
Tina	18	F	Yes	10	Yes

Table 3 shows eleven female climate strike leaders participated and four male climate strike leaders. This ratio reflects previous climate strike research that identifies women as more likely to be involved than men (de Moor et al., 2020). Jake was the only participant to comment on this gender representation, and he suggested;

> I find that in the strike teams it is very female orientated. That's not surprising because it's uncomfortable for males, particularly in my school and probably many rural schools. It's the climate movement, it has an embodiment of compassion, which just doesn't sit right with the male psyche which has unfortunately developed and it brings into question a lot of their own beliefs which people don't usually want to question.

Ideas about the male psyche of European New Zealanders in Aotearoa New Zealand (which Jake was referring to) have been claimed as being constructed around the colonial mentality of physical toughness (Robinson, 2020). Robinson argues that European New Zealanders' male identity can be linked with masculinity that is rural, pioneering, and tough. Results from a 2019 Aotearoa New Zealand gender attitude survey found 12% of the surveyed population agreed that physical and emotional weakness did not equate to masculinity and 16% believed caring was an attribute that was more important for females (Research New Zealand, 2019). These findings align with global representation of female dominated environmental and climate strike

movements in the Western world and are of interest for climate change educators. The exploration of motivating factors that are more likely to connect the male consciousness towards climate change engagement and action may be needed to address this balance.

The strike leaders interviewed all attended different schools and experienced varied levels of support for striking students. Seven strike leaders out of 15 schools reported receiving school support as strike leaders. Lilly appreciated that her school "did a really good job managing that [not taking over] and helping to guide us when we needed it but leaving us to our own devices." Marama suggested her school considered "it a great opportunity to learn outside of the classroom." The other schools ranged from active dissuasion to some support, as the strikes gathered momentum.

Varied levels of leadership support were reported in the media. The online newspaper, *Stuff*, reported in March 2019 that principals were sending mixed messages (MacManus & Daly, 2019). In February, 2019 the deputy secretary for the Ministry of Education, Ellen MacGregor-Reid, was reported saying that awareness of the environment was an important part of the curriculum (Collins, 2019). Contrary to this message, on 7th March, 2019, the New Zealand Secondary Principals Council Chairman, James Morris was quoted by the New Zealand (NZ) Herald saying Principals would not condone the strikes or support students taking time off school. (NZ Herald, 2019a). In the same article, Secondary Principals Association President, Mike Williams called the strikes a waste of time, suggesting the student impact on climate change would probably be zero. However, two months later, on the 24th May, there was a shift in William's messaging with the *NZ Herald* (2019b), reporting Williams saying it was good to see students focusing on making a difference.

Lilly, who was involved in promoting student strike action in a number of schools in her location, found that "some schools were really on board, some schools we have changed their views but there are still a group of schools who are not on board." For example, in Oliana's school; for each of the three strikes, suspension was threatened for those who attended the strikes. This made organisation from within the school difficult and Oliana said, "it is really hard to encourage others to come with us, especially when we are getting detentions or suspensions and a lot of people are worried what that will look like, especially for getting into university the following year." Students who were not supported by their school reported learning to challenge traditional authoritarian structures. For example, Lajos explained;

> I learnt a lot about power. That teachers or any authority over you that is making a threat of expelling, or detentions, or whatever, it

> is only possible so long as it is easier for them to do it rather than not do it.

It was suggested that students had to consider their values and balance their future with how or if these challenges were worth the consequences. It was evident that a lack of school support did not necessarily deter those who passionately wanted to be involved, it just meant they had to find ways to work around their school's discouragement. For motivated students the learning opportunities presented themselves regardless of the school's stance on the climate strikes. However, the learning experience was more positive for those who experienced school support. For example, Lilly felt her teachers "did a really good job at helping to guide us when we needed it but leaving us to our own devices".

It is of interest that the student climate strike leaders interviewed for this study attended schools identified by the Ministry of Education as Decile 5 or higher. According to the Ministry of Education, decile ratings indicate the relative socio-economic wealth of the community from which the school draws its students (Ministry of Education, 2021d). The deciles are rated from one to ten with lower decile schools receiving more funding to help students overcome barriers that lower socio-economic communities may encounter. While no educational assumptions should be made from decile ratings, the Ministry of Education asserts a view that decile ratings can reflect the different opportunities and choices available to students from low decile schools compared to those who attend higher decile schools. Madison stated, "A lot of what we saw were more Pākehā [European New Zealand] kids of senior years because they had maybe more freedom to go to strikes and skip school… a lot of the people involved had backgrounds in environmentalism, they are white and privileged." Oliana also felt those who took part in the strikes "…had the time to not go to school and the privilege to choose to not go to school." These comments align with global research into the climate strike participation that found 70-80% of respondents had higher education (de Moor et al., 2020), implying those who attended the climate strike largely represented a more privileged section of the community. The strike leaders expressed concern over the lack of diverse cultural representation within the climate strikes. This concern is symptomatic of wider challenges for social movements around equity and representation when considering who speaks for whom and whose voices are heard (Hayward, 2021). A *Newsroom* article, reported Hayward advising caution with the expectation that indigenous cultures would protest:

> indigenous communities, who are already carrying a quite significant burden of both feeling the effects of climate change and anxiety about the changing climate. On top of that, they're also

> expected to turn up in large numbers and to protest and to make themselves heard and to somehow pressure or lobby their government (Daalder, 2021).

Subsequently, in 2021 the Auckland chapter of *School Strike 4 Climate* disbanded, citing insufficient responsiveness to activists of colour and there was a need to make space for Indigenous-led kaupapa [values and philosophy] enabling the movement to transform and appropriately uphold their collective objective of climate justice (McKenzie, 2021). According to the *School Strike 4 Climate* web page, social justice was a key demand from within the strike movement. The complexities surrounding indigenous cultures, underprivileged and under-resourced communities taking power can be perceived as daunting and yet another challenge for the climate movement.

These findings are derived from student climate strike leaders who attended higher decile schools, and while there may be some cross-over with students who attended lower decile schools, these findings cannot be considered representative of students who attended lower decile schools. Considering the substantial social and economic burden climate change is projected to have on poorer communities, the lack of representation from lower decile schools amongst climate strike leadership may be significant. Experiences, priorities and expectations of lower socio-economic communities may differ to those from higher socio-economic communities; consideration on how best to support and increase engagement with this demographic is crucial for climate change educators.

Parental and whānau (family) support was a consistent factor with climate strike leaders. Thirteen strike leaders indicated their environmental sensitivities were derived from their family values. Only Aroha and Madison suggested their families were not environmentally aware, but nonetheless felt their political involvement in the strikes was fully supported by whānau. Aroha recalled, “they were supportive of helping out and tried to be more environmental.” Madison believed her social conscience was family-inspired, as she said, “they wouldn’t go march at a rally or anything, but they raised me to be very careful about justice and are very pro-social justice.” The positive impact family support had on the climate strike leaders often gave them the confidence to take on challenges they may not have otherwise attempted. Catherine, as a 15-year-old strike leader felt, “I am really lucky to have the family I do. They have been a real help with keeping me motivated. I have them to remind me it will be okay”. Chris Hipkins and Greg O’Connor, Members of Parliament for the Labour party were reported as saying participation in the strikes should be the decision of the parents (NZ Herald, 2019c). The transmission of family values was considered an important factor that

encouraged students to lead an influential climate strike. They felt supported and their actions were endorsed or accepted by significant family role models. The implications regarding family values and family support (or lack of it) may have on climate change engagement are further considerations for climate strike educators.

4.2.2 **Context of teacher participants**

Adult participants in this research were situated in different schools to the student participants. The following table describes the context of the teachers and senior management interviewed for this study.

Table 4.2

Context of teacher participants

Pseudonym	School location/type	School size	Decile	Teaching subjects	Previous environmental education (EE) involvement
Ava	Small coastal town	500	5	English/Media teacher Acting Deputy Principal	Not involved in EE
Kathy	Small rural town girls' school	1,400	6	HoD design department	Extra-curricular environmental group
Kowhai	Small city	1,400	5	Te Reo teacher Deputy Principal	Not involved in EE
Lizzie	Large coastal town	900	2	Drama teacher	Not involved in EE
Nathan	City boys' school	2,400	5	HoD Drama	Not involved in EE
Stella	Small rural town	1,400	6	HoD Social sciences	Extra-curricular environmental group
Susan	Large rural town	900	9	Science teacher	Taught cross-curricular sustainability studies
Tim	Rural area school	1,000	5	Science teacher	Pushed need for sustainability studies

The interviewed teachers taught in schools of varying sizes, and were situated in different geographical locations. Most taught at co-educational state schools except for Kowhai, who taught at an all-girls school and Nathan who taught at an all-boys school. Teacher participants included a representation from senior management, head of departments, and a range of teaching subjects. Four of the teachers, Kathy, Stella, Susan, and Tim were actively involved in encouraging environmental education within their school. Susan used inquiry-based learning (learning that is driven by students curiosity and encourages connection and collaboration) to

teach a cross-curricular climate change programme which was offered in her school, as an option, to junior students. Stella taught sustainability as part of the social studies curriculum. Kate and Stella were involved in extracurricular environmental groups and Tim integrated climate change education into his classes. The remaining teachers expressed a lack of previous engagement with climate change education, as Kowhai said, "…it hasn't really been on my radar until you have got hold of me and have given me these questions." Nathan also reported, "I feel I am ignorant if I am honest with you." Ava, Lizzie, Kowhai and Nathan indicated they had no involvement with sustainability studies or climate change education prior to the interview.

The climate strikes appeared abruptly for some teachers, some were unaware of the furore the strikes were creating, until alerted by students. Kathy said, "I hadn't actually clicked on to the whole climate strike stuff, it was the kids that were telling me about it." Deputy principal Kowhai similarly recalled, "it was one of our senior students and she wasn't like a leader or a prefect. She was just a senior student that was obviously passionate about the kaupapa [philosophy/values], it wasn't really on our radar until she came to tell us." All teachers interviewed, personally supported the climate strikes even if they taught in schools that extended limited support. Nonetheless, some commented on the challenges the strikes presented. Kowhai spoke of the potential level of disruption and difficulty for school leadership with managing the strikes, stating:

> So we envisage probably 80% of the kids just walking out of school because there was a march and they weren't really knowing what it was for… we had no control of it, so we were worried about the safety of the girls.

At Kathy's school, the strike was instigated by a parent. Kathy felt, "as a teacher, what we found was basically, the strikes gave the kids a reason to mass exodus from the school and go to McDonalds [fast food outlet]." The position of responsibility and authority teachers and senior management were familiar with appeared to be undermined by the climate strikes, a relatively new experience that had to be managed carefully. Individual teacher perspectives were rarely presented in the media. The position and perspectives of schools were voiced through Principals and governing bodies, such as the New Zealand Secondary Principals Council. The teachers I interviewed came from different departments and levels of responsibility, and they offered diverse perspectives from the student participants. They offered adult and teacher perspectives on student motivation for climate striking, learning outcomes that may have been gained from the strikes, and pedagogical ideas for climate change

education. The perspectives from these student and teacher participants are now presented, beginning with what motivated and engaged so many students to strike.

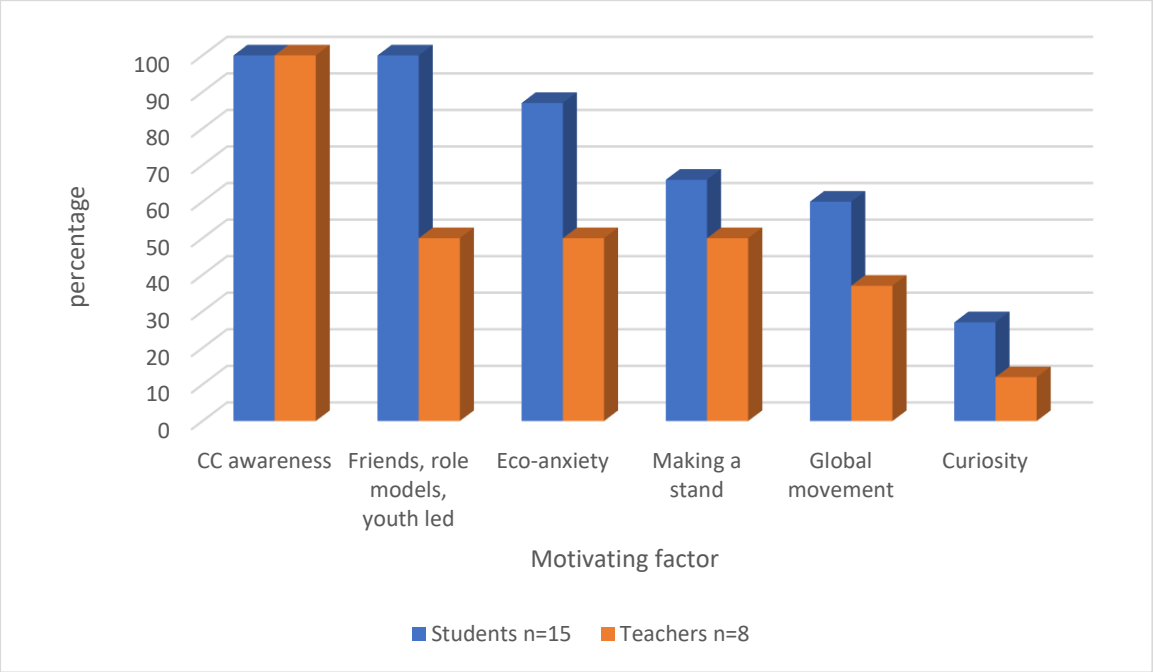
4.3 Motivation and engagement

4.3.1 Introduction

The climate strikes were historical as they were the largest student-led activist movement Aotearoa New Zealand has experienced. The strike movement motivated over 170,000 participants nationwide (Deguara, 2019) to protest about climate inaction. In Aotearoa New Zealand, this occurred despite a lack of mandated climate change education in secondary schools, and as such the motivation behind the students' actions deserves further exploration and may improve educators' understanding of youth engagement with climate change. All participants acknowledged that the nature of each individual's motivation to become involved may have differed depending on the individual. The graph below reflects the key motivating factors mentioned by strike leaders and teachers during the interviews.

Figure 4.1

Motivating factors encouraging youth participation in the strikes



The most pressing motivator identified by both student strike leaders and teachers for students to attend the climate strikes was *climate change awareness*. Whilst strike leaders unanimously felt that friends, role models and the youth-led nature of the movement were a strong motivating factor, this was considered a factor by only half the teachers. Teachers were less likely to consider *climate anxiety* and frustration as a motivator compared to most strike leaders, who

felt anxiety was a key motivator. Being part of a *global movement* and *making a stand* on an important issue was considered motivating according to more than half the strike leaders, but once again, fewer teachers considered this a motivator. The motivating factor least suggested was *curiosity*. For a small number of strike leaders and one teacher, curiosity around activism or the climate crisis was thought to encourage participation. Each of these motivating factors is expanded upon in the following sections.

4.3.2 **Climate change awareness**

The motivator identified unanimously by all student and teacher participants was an awareness of climate change. The online media platforms also reported youth awareness of climate change as a considerable motivator. Youth awareness and concern was often cited by strike leaders as poignant, as Marama illustrated:

> I feel that in recent years everyone had the weight and knowledge that it will be a massive problem soon or it is a massive problem now, but we haven't had the resources or the capability to know what to do about that exactly.

Josh suggested youth are aware that climate change will impact on their future and this awareness encouraged many to attend the strikes. He stated, "we predicted about 400 would come along, but it ended up being about 1,500. So, the first 400 were quite possibly motivated because they knew us, but the rest were motivated by the issue". Sophie Handford, founder of the School strikes in Aotearoa New Zealand recalled, in an interview with *The Spinoff*, being a twelve year old when she first gained an awareness of climate change. She lived on the beach front at Paekakariki (Kapiti Coast, Wellington) and her parents received a letter from their local council warning of sea level rise:

> at first she couldn't grasp the concept, her house was elevated, and the water seemed so far away, and if this was happening to her, then what was happening to everyone else's houses? I was gobsmacked that nobody was running around and screaming about it (Casey, 2019).

The students felt that their awareness and concern was not always acknowledged by adults though, as Lilly stated, "I think a lot of people care about environmental issues more than we give a lot of teens credit for. They care about their futures and they care about what is happening

in the world." This quote implies Lilly feels youth may not feel heard or understood in regards to the global pressures they feel.

The teacher cohort also made references to awareness about climate change as being a significant student motivator. There were, however, subtle differences to the strike leaders' views. The teachers empathised with students' concerns regarding their insecure future and also felt climate change awareness was, for some, a motivator to strike. Nonetheless, the teachers' comments were, at times, either preceded with more thought, were briefer, and occasionally tinged with scepticism. For example, Kathy commented, "I had some kids that were genuinely quite interested in it," - implying that many were not. Stella said some students were driving it, then suggested, "the rest of the peer group went along because, well, it was time off school and that would have motivated a few as well, you know". The 'time off school' motivator, as opposed to a genuine concern, was reported as a factor by some politicians during the strikes. For example, Radio New Zealand reported Simon Bridges (the leader of the Opposition) saying he did not want to support "a whole lot of people who are fair-weather friends on this issue to say 'you know what, sweet, this is a day off school, I'm going to join the protest'"(Radio New Zealand, 2019a). Such an argument, the strike leaders suggested, attempted to undermine students' motives, by default student voice, and the significance of the strikes.

Susan, a teacher who encouraged climate awareness at her school, was initially unsure what motivated students. She stated "I definitely had some students who [thought] it was a big deal to them and that's the area of conservation linked to climate change that is somewhere they see themselves in future years". Tim, also a teacher advocate for climate awareness in the classroom, felt students saw it as "a good example to show leadership, [they think] we can put this stuff on our resumé for scholarship applications," indicating personal motives may supplant climate change awareness or concern. The teacher cohort, at times, appeared to position students' motivation for climate change awareness as being aligned with personal gain. In contrast, the student cohort unequivocally considered that for many (not all), climate change awareness and the concern that resulted was the major motivator for striking students.

The passion required to be a climate strike leader may encourage the leaders to focus on the positive motivators while the teachers, by the nature of their job, are likely to observe broader motivating possibilities - resulting in more circumspect answers. Despite teachers personally supporting the climate strikes, they appeared less assured than student leaders of the magnitude climate change awareness played in student's motivation to strike. While the nuanced difference between the climate strike leaders and teachers understandably reflects their

differing roles and experiences of the strikes, this difference perhaps presents a somewhat deficit view of the future generation's motivation for climate change. It also supports the strike leaders' perceptions that despite their vested interest in the future, youth voice is still largely unheard. The motivation of friends, youth and role models also showed some disparate views between the two cohorts, and these are discussed next.

4.3.3 **Friends, youth-led movement, role models**

The driving motivational force of friend networks, the youth-led nature of the movement, and role models were identified by all climate strike leaders. Half the teacher cohort suggested this was a possible motivation for striking youth. The strike leaders' comments were typified by Moana, who said, "People see their friends going so they want to go." Campaign manager Simon, effectively utilised this motivator to promote the strikes, stating:

> It worked best if we went to students and then got them to spread the message to their schools. A lot of people would not have gone if their friends had not gone with them… attendance with friends validate your actions.

His campaign did not waste time trying to attract those not interested in climate change, he believed those people would not be swayed by the issue but might be encouraged by large numbers, stating:

> There was no point advertising to people who didn't already care about climate change because that would be a waste of time. It is way better to get the message to people who do care about climate change. If we had so many people, more people would come.

The idea that reluctant or non-supportive youth were more likely to be persuaded to participate if their friends were attending was reinforced by Tina, who stated "if someone is a climate denier and they have a friend that goes to the strike, it is much easier to encourage them to come." If students were uneasy about striking, having their friends with them created a feeling of safety-in-numbers, according to Marama, who stated, "a strike is definitely something you do with your friends. It is such a daunting topic so having those numbers there and having your friends there is an amazing way to tackle it." Huia also felt strikers "would only choose to go if they felt safe because they had their friends around them."

Once there, however, most strike leaders believed that even reluctant strikers would have increased their awareness of the issues, thereby motivating further engagement in climate change, the strike movement, and potentially rallying others. Flora explained that from her experience, she "felt strongly about it and because of me, some other friends joined and then after going to the strikes they felt strongly about it too".

The youth-led movement and young role models (such as climate activists including 15-year-old Greta Thunberg) attracted many who may not have otherwise considered striking. Flora felt that Greta Thunberg "made it feel like anyone our age could make a difference." It was the youth-run and youth-led factor that influenced Simon's participation. Despite his environmental awareness, he initially felt reluctant to engage with the strikes. Simon described how he became involved:

> At school I was part of the environmental committee. At first I was unconvinced about what the strike would achieve. Then just seeing what she [Greta Thunberg] does at such a young age proves that someone that young can make change. It is all very well saying students are leading the strikes, but unless you see the person who is leading the strike is a student then it doesn't have a face.
>
> I was asked to come to a meeting for school strikes. It was actually organised by someone who was really young and I was impressed that someone at such a young age was able to do that and had such strong convictions about climate change that she wanted to organise such a massive movement. It encouraged me to take more part because if someone younger than me can do this, why can't I? That is when I really got into it because I saw what the point of the strikes were, showing that students really cared about this issue, and secondly, to raise awareness about climate change and the climate crisis. Because it is all well and good for scientists and politicians to talk in the media about it, but I know a lot of my peers do not watch the news, do not engage with traditional media, so if we had students making waves, creating a protest that would be in their face and seeing it on social media, they may be more interested in it and maybe be more curious about it.

Lilly went a step further and suggested adult involvement would undermine the strikes:

> I think the whole aspect of the movement is about youth organising things for youth, standing up for youth. I think that was really important because if you had an adult pushing that youth need to be out striking, it's like, well, 'that's easy for you to say'. You see leaders in the community, like Sophie Handford who started it in Aotearoa New Zealand, people can look to them and say they are there and in my community and they stand for the same things I stand for. You can start to see yourself in them, that is when people start to get more connection with the movement.

Role models who reached beyond youth were discussed by only one strike leader, Huia. She said:

> There are climate activists, like indigenous activists, older activists who have been working in this space for a really long time and I think I view my role models from a range of people and from people around me. So I would say people coming weren't necessarily role modelling off Greta but people in their own lives and people they know.

Although action may have been taken without Greta Thunberg initiating the global school strike movement, the blunt messages radiating from someone so young and angry were inspiring, according to Madison, who stated:

> That is why Greta is so effective. The constant exposure that our generation has to fix it has made our generation numb to the topic of environmentalism because we knew it was important, we just grew up with it thrown in our faces so much that it was our responsibility, our burden to carry. I think why Greta was so effective, she mobilised kids into saying 'Hey that's bullshit, you need to take responsibility for your actions because by the time we grow up it is going to be too late'".

Madison was inspired by Thunberg, who represented someone of her generation, holding older generations to account.

Four out of eight teachers indicated friends and a youth-led movement as possible motivators. Susan, a teacher of sustainability education asserted:

> They were definitely influenced by their peers and I am sure a few went along that didn't have any drive for it, but because their friends went along so they went along with it… the fact that Greta was their age and part of their peer group was quite motivating for them. It wasn't driven by adults or teachers or parents telling them to do something, [it] was driven by someone they could relate to more.

Kathy, a Head of Department and leader of the school's environmental group witnessed the strikes at her school being incited and led by an adult. This was the only school in this research that reported adult-organised strikes. Kathy felt this diminished the power of the strikes for some participants and stated, "for the first rally, a few of them realised that it was being organised by an adult and it took the 'oomph' out of it. They realised it wasn't about them or what they wanted to do with it."

Youth voice and leadership appeared a greater driver than adult leadership and offered a motivating factor behind whether students decided not to strike. A youth-driven focus leading the strikes enabled role models to emerge, and inspired others who were previously disengaged, towards greater engagement and action.

Role models other than youth that were identified by the strike leaders included parents and whānau. Although parents/whānau were not explicitly mentioned as role models, it was of note that all climate strike leaders interviewed experienced family support. Simon recalled, "my mum is completely supportive of the movement and they didn't mind that I missed school". Many students credited their families or extended whānau as the reason they were personally interested in climate change, politics, or were environmentally empathetic. Furthermore, the influence of parents was considered the most likely reason for students to choose to not attend the strikes and messages from some politicians encouraged parents to decide participation (Radio New Zealand, 2019b). Flora believed, "the first strike had very few people…. no one's parents supported it." Similarly, Moana commented, "a lot of people were impacted by their parents' views on it". While few interviewees directly identified family and whānau as motivators or role models, they did believe parents held sway in students' decision-making on whether or not to attend the strike. Thus, the climate leaders felt student actions were covertly influenced by their parents and whānau.

Within the teacher cohort, only Susan directly referred to parents as having a motivating influence. She suggested "I am not quite sure whether it [the motivation] was from their

parents, their family situation." Parental pressure was experienced by Ava, who was acting Deputy Principal during the time of the strikes. She explained her school allowed participation in the strikes, with parental permission, and that students who participated in the strikes however would be marked unauthorised absence. Ava's school received criticism from some parents who felt the worthiness of the strike meant student participation should have been acknowledged, stating that "some parents believed it was on the same lines as a sporting event or an outdoor education event". Ava was sympathetic to this viewpoint and said, "a lot more would have participated if it wasn't for the attendance issue." These perceptions suggest that family values and practices hugely influenced youth and were, at times, a determining factor in students' participation in the strikes.

Friends, youth-led advocacy, and role models were acknowledged by all climate strike leaders and half the teachers to significantly impact student motivation and youth agency to become involved in the climate strikes. How best to utilise the influencing nature of youth and family, therefore, requires considerable thought for climate change educators. This is notwithstanding students whose families may question or oppose the need for climate change education as this may offer additional challenges to educators who must already consider the role emotions play in climate change education.

4.3.4 **The emotional journey: Apathy to action**

Climate strike leaders frequently reported they had been on an emotional journey as they navigated their way from climate apathy to climate action. This journey included and ricocheted through the emotional stages of; apathy, awareness, anxiety, anger, and frustration. While many strike leaders recalled these stages undermined their mental health, they believed, that for themselves and others, successful negotiation through these stages could ultimately foster greater understanding of climate change and increase a sense of political urgency and therefore, agency. The emotional journey described by the climate strike leaders deserves exploration and understanding as both a disabler and a motivational opportunity for educators.

Strike leaders generally considered a limited understanding of the climate crisis induced apathy and this was the starting point of their journey. As Flora observed, "so many people from what I saw had no idea about the issue and didn't have any political or environmental understanding." It was argued there were two reasons for this. Firstly, they had not been exposed to useful information on climate change so had little awareness about climate change. Josh, for example, commented, "I don't want to say apathy, but that is what it was, not quite understanding it is an issue that affects them." Similarly, the Herald reported climate activist Murupaenga-Ikenn,

saying “the urgency of the situation has not settled in people’s hearts yet because they are disconnected from society and nature” (Czerwonatis, 2019). Secondly, apathy was considered to stem from over-exposure to a ‘doom and gloom’ discourse and as a coping mechanism that individuals may have refused to engage in the concept of a climate crisis. Tina suggested, “if it is too sad, some people choose to put their head in the sand.” This led to inaction thought Oliana, who stated “there are some people who feel it is too much and it is easier to do nothing about it”. Huia also suggested that the feeling of hopelessness could stymie action, indicating “they say why would I bother skipping school if it is not going to do anything. It is a hopeless fight anyway”. For some, apathy can work as a protection strategy, explained Madison, signalling that “it starts with apathy because that is kind of a defence mechanism to everyone saying, ‘this is your burden, this is your burden’, because if you thought about it too much it would be so terrifying.” This protection strategy, combined with a lack of knowledge about climate change disables motivation towards climate action. However, once the strike leaders had the opportunity to learn more about climate change, there was a motivational shift and their journey really began.

Increased awareness of the climate crisis was often considered a revelation by climate strike leaders. For example, Catherine stated, “the more you learn about this crisis, the less you have time to think about anything else.” Prior to the climate strikes five leaders reported having no interest in political issues and four indicated little or no environmental knowledge but as their awareness increased so did their interest; “we start learning more about it and once we are there, we can’t stop,” said Madison. This often motivated an upward spiralling of greater understanding, and Madison found, “the [learning] growth was exponential, it was crazy.” As students’ understanding of both scientific facts and historical injustice grew they were motivated to conduct more personal research into climate change issues. Conversely, however, the heightened awareness could spiral them back to anxiety, “as you learn more the anxiety really kicks in,” said Madison, potentially disabling the new-found motivation, “that is what has happened to me and every advocate I know”.

Lajos attempted to ease his anxiety through further research but found it only reinforced his distress. He stated:

> I was reading a lot of science on climate change and watching YouTube videos, and becoming more and more depressed on the gap between what the scientists are saying to beat horrible outcomes, and what the government is willing to do.

This mismatch further increased apprehension, "once you understand how drastically the world needs to change and how we needed to do this 10 years ago, once you have that understanding, it is anxiety filled," reported Madison. Sitting alongside their heightened awareness of climate change was an increased understanding of the lack of global action to date. This reinforced previously held concerns of a potentially dire climate-changed future and this led them further into anxiety.

Youth climate distress was a prevalent theme to emerge from this research. Oliana described her generation's view on the climate crisis as, "such a massive, massive, massive weight to hold." Despite no direct questions about climate distress or anxiety, most strike leaders emphasised the overwhelming concern youth feel in regard to climate change. Madison articulated that, "our generation knows in the back of our minds this is a huge problem, I feel a lot of people in my generation experience climate anxiety, that is a huge thing." Comparable comments were reported by the media suggesting youth felt an 'impending doom' (NZ Herald, 2019c; Radio New Zealand, 2019b)

The lack of national and global future planning for climate change mitigation contributed to youth despair, suggested Simon, who stated "there is a lot of anxiety about what is going to happen because it is not very clear that we can do something." Marama referred to it as "eco despair," saying "heaps of people were unhappy with how the government was treating climate change," and Mary felt, "my generation, we know about it more than old people do." However, 27 year old Chloe Swarbrick, Green Party list Member of Parliament, suggested apathy was "not so much generational as ignorance" (O'Connor & Harvey, 2019), and James Shaw, leader of the Green Party and Minister for Climate Change admitted the situation would be frustrating for youth. He acknowledged "the sense of crisis is growing here. So I completely understand why anything that we do isn't going to feel like enough" (Shaw, 2019).

Interestingly, and of value for this research, while this anxiety sometimes led back to a sense of hopelessness and apathy, for the climate strike leaders, it also stimulated motivation. As Flora said, "I think the worry [and] the anxiety motivated me more to make a difference." This outcome was also suggested by science teacher Susan who taught climate change and stated, "I know it will add anxiety to a couple of my students, but I know, in the same respect it will probably drive them." Reframing climate anxiety as a potential driver rather than an inhibitor may reduce one of the barriers in climate change education.

Once the anxiety was released, Madison said, "I thought I had to do this, it is just go, go, go." She felt it was important to experience anxiety because "I would rather be anxious about the

climate crisis than let it just happen to me and roll over in defeat." Lilly suggested anxiety could be a catalyst for, not only motivation, but it could also be empowering "I want them [youth] to be scared, I want them to wake up and be empowered." Working through their increased anxiety could potentially motivate and possibly empower, but it could also lead to anger.

The emotion of anger was reported as part of the strike leaders' journeys. Lajos felt it was not just the strike leaders who felt this, as he suggested that with climate change, "kids are motivated by fear and anxiety and anger." Lilly disclosed feeling, "really confused and angry, why no one had done what was needed to be done". An outlet for this anger was provided by Thunberg who was reported by the BBC news to speak for her generation when she said "If they want us to stop being angry, maybe they should stop making us angry," (Rincon, 2019). Her outspoken anger provided youth with a role model, and the strikes an avenue, for youth to vent their own anger. Madison found this cathartic because, "she allowed us to feel anger. I had never realised that was an option before, that I could be angry about everyone telling me it was my burden to carry." This anger was usually directed at previous generations, leading to a sense of frustration at the lack of action to date. As Oliana suggested, "a lot of people have the capacity to worry and become angry at the fact nothing has been done." The frustrations articulated by the climate strike leaders are encapsulated within anger but the multiple concerns that emerged merit discussion.

4.3.5 **Types of frustrations**

The frustrations expressed by the climate strike leaders can be categorised into four significant themes. Frustration with older generations, with Western political systems, with large corporations, and with minimal global action - despite decades of rhetoric. Each frustration theme is now further explored.

The first frustration expressed by climate strike leaders is with older generations, particularly people they are associated with and/or are community role models, who do not truly understand the predicament or needs of youth. For example, Jake said:

> I think they [his Principal and teachers] still haven't really grasped what it's about. They think it's more like the stuff that they're trying to advocate for, like 'Oh great, students are on strike for the environment then we can get more trees'. It's just their generation… they don't really share the same interests or passion for any sort of systemic change.

Jake's Principal verbally supported his role as a climate strike leader, but Jake felt he did not really *understand* the climate change concerns of youth. Similarly, Oliana, who attended a city school, felt the leaders at her school did not understand the level of climate anxiety and frustration experienced by youth. She felt she had always been a respectful student and with many of her whanau still living in the Pacific Islands and vulnerable to the encroachment of climate change, it was an issue she felt strongly about. She found it galling that her school obstructed participation in the strikes. The rural school Josh attended drew its students from a predominantly farming community and was also reluctant to support the strikes. Josh found ways to work around his school, to participate in the leadership of the climate strikes because he felt "for everyone in my generation it collectively seems a very big issue." Despite the lack of school support, both Oliana and Josh pursued leadership roles in the school strikes, developing skills such as resilience and resourcefulness.

Frustration with older generations went beyond the school communities. Huia described her experiences with members of her local council. She was invited to a meeting as a voice for youth and as a climate activist, stating:

> It is the first time I had gone into the meeting, and I looked different and I am the only young person in the room. I critiqued the way they were doing things, why are you setting up these goals and what does it mean? And they were all just smiling at me, I thought 'are you guys listening? I am kind of critiquing you guys.

Huia was initially excited to have the opportunity to express her views at a council meeting, but once there, she was not sure if they were seeking genuine youth perspectives and climate change strategies or if they were simply box-ticking the youth voice and climate consultation section. She felt unheard.

The reason for a disjunct between generations was considered by Madison to be a lack of emotion:

> In my experience, older people look at things factually and logically but then we are polluting rivers and there is no emotion behind it. I think young people have been so motivated because of the emotion. It hurts your heart and it takes this deeper understanding that it has taken young people to mobilise for people to actually take this crisis seriously. That in itself is

> disheartening - that it is young people who are leading this because older generations haven't.

The news media reported adults who did not support the strikes and who expressed cynicism regarding student's motivation to participate in the strikes. These comments were outweighed, however, by the number of adults reported to supported the youth action, this included an open letter with 11,000 signatures (Radio New Zealand, 2019c), the 260 businesses and universities involved in the strikes (Roy, 2019), and the 250 media organisations from around the world – all committed to heightened climate coverage.

Nevertheless, strike leaders commented on feeling let down by adults in positions of power and those working in organisations whose primary role is to engage, support, lead and represent their community for the betterment of their future. This 'generation gap' or feeling a lack of alignment in values and priorities between youth and adults is not new. However, the frustration expressed by the strike leaders in regard to older generations not listening to the youth voice may reduce youth agency and negatively impact future climate action.

The second theme of frustration was aimed at the Western political and economic systems. As neo-liberalist tendencies have prioritised the economy in recent years, social and environmental wellbeing has suffered (Lange, 2017). Jake expressed a need for "systemic change," and the need for a change in priorities was eloquently summarised by Lilly who queried, "why did they prioritise the economy over our future when there will be no economy if we don't have a future, because you can't eat money?" Moana suggested, "we can see the effects of capitalism and the way in which we treat our economy has on the environment." Many interviewees showed confidence in a different and new economy, as Jake said;

> It needs people to understand the economy in the sense of climate change because people are like 'oh, it's about the economy'. There needs to be education about how good it [transitioning to a green economy] could be for the economy if we actually sorted it out.

Transitioning from what was considered an exploitative economy to a greener economy was also suggested by Lajos, noting that "the aspects of the economy that exploit the planet is basically what is causing climate change. We can restructure it to make a donut economy or a circular economy, an economy that is carbon zero." Aroha felt that in the wake of COVID 19 the government had the opportunity to "build up a greener economy, one that would help the government with their 2050 target for Zero Carbon." The acute frustration expressed here at

prevailing economic systems has possibly encouraged students to gain a better understanding of the current economic system, how it is failing and thus inspiring greater political awareness. This led to seeking possible alternatives that theoretically are more socially equitable and environmentally sustainable.

The third theme of frustration was directed at large corporations and their perceived lack of social and environmental responsibility. Madison suggested that "It's the larger corporations and the ways in which our parliament and politics works that are affecting the environment the most." She felt youth had to unfairly bear the climate burden largely inflicted by corporate irresponsibility, stating:

> We grew up with all this messaging to us that it is our responsibility to fix it and look at all these companies that are polluting the Earth, and they say 'when you grow up you are going to need to fix it'.

Transferring corporate power back to the people was considered important, according to Marama, who indicated:

> I learnt so much about how corrupt the world really is and all the corporations, and how as people we need to do so much to get the ball moving into our own court and bringing it back to what the world should really be about - and that is people.

The climate strikes motivated youth to contemplate the personal and collective power they had over political and corporate regimes, as Moana stated:

> I think they definitely encouraged people to not only make individual changes but also to lobby their local MPs and larger corporations that they can get in touch with just to say, 'Hey, we don't think we're doing enough, can you please try harder to do better. You have the ability, you have the power, you have the resources.'

Lobbying local government and corporations to adopt climate change action was deemed to be more productive than individual change. Josh suggested, "I think individual change should be more towards influencing government and corporations to change because that is where the actual power is." Many climate strike leaders felt that, historically, there had been a lack of

pressure for the crucial, systemic changes needed and this prompted the fourth theme of frustration.

The final theme of frustration was directed at a lack of significant global action. Mary stated that, "you see people in power not doing anything… as you take action you can really see the poignancy the frustration has". She went on to say, "the climate strikes can make a global difference and they are making a global difference".

Individuals do have a responsibility, suggested Catherine, but she too wanted to see global action, noting that "personal responsibility in terms of climate change is really important if we are to grow as a species and as a society. But in terms of climate change specifically, definitely, government and larger organisations globally have to play the biggest part." For Madison, it was about political will. She stated:

> It has never been a question of if we have the capacity to do something about climate change or if we have the capacity to mobilise this country and take charge. It has always been a question of when do we start and how long will it take us to get there? How bad does the climate crisis have to be before we actually start doing something?

The frustrations experienced by these strike leaders encouraged critical thought and led to an improved understanding of systems. It increased their confidence to challenge the political and economic status quo and consequently they considered alternative ideological possibilities.

This emotional journey or variants of it led the interviewed strike leaders towards action. The climate strikes provided an avenue for climate-aware, anxiety-fuelled youths to participate in an action. For the leaders, it was this action that eased some of their anxiety and frustrations. For example, Lajos said "the climate strikes pulled me out of anxiety." For Catherine, the strikes also offered a sense of connection, because "a lot of people would see school strikes as a way they can feel connected. I found the strikes are a great way to deal with climate anxiety and climate grief." Lilly also felt, "they [students] would see school strikes as a way they can feel connected". This feeling of connection was important for the strike leaders, as it both eased anxiety while motivating youth towards greater strike participation. Facilitating a sense of connection, is perhaps, one of the keys towards reducing climate anxiety within the youth population.

In response to the emerging themes of climate anxiety and frustrations from the climate leaders' interviews, the teachers were asked for their perception of climate anxiety in youth. Seven out of eight of the participant teachers agreed some youth are likely to experience a level of climate anxiety, frustration, and possibly anger. Only Tim, who taught at an Area School, experienced a lack of student anxiety.

Nathan felt "there is a profound sense of anxiety around the issue." Kowhai, a Deputy Principal, agreed that adults may not necessarily appreciate the level of anxiety, stating:

> I think there is anxiety with our youth, they know they are going to inherit it and so they are getting anxious about it – and what are we doing about it? Yeah, I think they are [anxious] and we don't understand as teachers.

Other teachers suggested that while climate anxiety was apparent, it was only one of numerous issues facing youth. Ava, an Acting Deputy Principal said:

> They're coming through with a multitude of problems, but climate change is at the forefront, definitely. I think it really worries them more than we give them credit for. It is constantly in their face, it is on their social media, it's on the news, it's in the paper, it is everywhere they go, and I think it's really causing a lot more anxiety than we realise.

Similarly, Lizzie, a drama teacher in a low decile, predominantly Māori school, felt climate change was a consideration but not the most pressing reason behind youth anxiety at her school. She stated, "if I look at the themes creating anxiety at our school, climate is definitely not one of the highest, but it would be in the top five."

Kathy suggested students feel anxiety connected to their feeling of powerlessness and frustration in the face of large corporations but questioned if this motivated action, stating:

> To be honest, I think they think the issues that they face are to do with big corporate companies and they really feel that nothing that they do will really change anything, but at the same time, they don't make conscious decisions to change little bits either. But, again, I think that is around education and I would like to see more education in schools around those issues.

Here, Kathy reinforces the motivator identified previously, that of climate change awareness, and is suggesting a greater understanding of climate change may be a more effective motivator than climate anxiety or frustration.

Tim was the only teacher to feel that at his school, climate anxiety was not evident. In fact, he expressed exasperation at the lack of climate anxiety among students. Teaching in an area school, many of Tim's students were from rural backgrounds and he, like Kathy, felt students lacked the knowledge needed to be anxious and to motivate action:

> I was almost disappointed not to feel much of that [anxiety] in the student body… Many of the students at our school haven't really embraced how dangerous climate change is and what it means for the future. They haven't had this, 'oh my God', and it takes a long time to get to this.

When asked why he thought this was, Tim replied:

> Māori students who come from households where poverty plays a role, where society has not given them much anyway, and they don't have much care about where this Western society is going anyway, because they don't feel that engaged with it.

A lack of Māori and Pacific Island student engagement or climate anxiety was also noted by Nathan, who stated:

> Some of my Māori/Pasifika students were just a bit apathetic actually, there were a few that did go, but they were a bit more apathetic and thought 'oh it doesn't really relate to me, I can't really see why I would go'. We did get quite a range but it was a majority Pākehā [New Zealand European] response to strike"

This response reinforces the correlation between a lack of climate change awareness, or perhaps, a lack of culturally relevant climate change awareness and apathy. Furthermore, the comments of Lizzie, Tim and Nathan raise the point that priorities or motivation may differ for non-Pākehā youth. This is an important area of consideration for climate educators.

Whilst the teachers' comments acknowledged differing levels of anxiety within their student population, they did not reflect the palpable concerns expressed by the climate strike leaders.

These comments again reflect the differing roles and priorities of each cohort of participants. The immersive and emotional environment strike leaders worked in would arguably highlight the level of climate anxiety among youth for them. The teachers' roles required a broader lens and therefore offered a relative perspective that also considered other youth issues, particularly, for those teachers who had little to do with sustainability issues previously. Nonetheless, the responses from both cohorts in this research suggested that climate anxiety and frustration are significant emotions for youth on their journey towards climate action. These stages had the potential to disengage or motivate students. With greater consideration regarding the potentially disabling factors, challenges and motivational hooks presented by apathy, awareness, anxiety, anger, and frustration, climate change educators may gain insight into a pedagogical practice that is more pertinent for today's youth.

4.3.6 **Making-a-stand**

The value of individually or collectively 'taking-a-stand' was considered both motivating and empowering for youth. Lajos reflected that Aotearoa New Zealand historically had stood its ground on issues of importance, because "we used to be an activist nation, we are learning again the power of organising and the power of uniting". Seeing someone else assertively state their position and rally others was motivating, suggested Lilly, who reflected "Greta taking a stand was a really brave thing to do but it was also quite effective and important when starting a movement with young people". Likewise, Madison felt that Greta's stance "resonated with a lot of people, because we saw someone stand up and hold all the generations to account." Jake believed that if you were to make-a-stand you needed to 'live your politics' and to be a 'vanguard of change' which required you to become 'civil-disobedient'. For Jake, civil disobedience meant "questioning, not just taking things at face value." The awareness raised by seeing Greta or other young activists assertively and publicly questioning current political ideology and taking action inspired others to do the same.

Furthermore, it was considered that for the strikes to create the greatest impact and take-a-stand collectively, it was important they "disrupted business as usual," thought Mary. She suggested this was the justification behind holding the strikes during school hours, a strategy that enabled a louder youth voice. Many of the climate strike leaders were not politically active before the climate strikes, but seeing others stand front and centre of this issue encouraged them (and they believe others) to do the same.

Half the teacher cohort also indicated the students may have been motivated by others taking-a-stand. Lizzie believed the strikes gave students:

> A sense of mission and a sense of purpose, of being able to make that stand. It has always been a great inspiring moment when you say 'oh life is like this, blah blah it's all very routine but we get to do this'. The students really seized on that opportunity.

Nathan expanded on this idea, and stated, "for some, who had the foresight, they recognised it wasn't just the action that they committed to, but it was the way it was perceived." By being assertive and standing up for a cause, youth had the opportunity to not only make a stand and voice their concerns but by taking that stand, they could perhaps, become role models themselves. Seeing others stand up and publicly voice their concerns encouraged many others to do the same, starting a global movement.

4.3.7 **Being part of a global movement: A 'cool' thing to do**

The fashionable status of climate striking, or lack of it, was considered to impact students' motivation to strike. The global escalation of the climate strike movement was considered, by many strike leaders, to influence individuals' decisions to strike. Jake suggested it was "the biggest draw for students, the fact this was going to be massive and a huge thing historically, a huge thing to be part of." Lilly also felt students wanted to be connected to a large global movement, stating:

> …if you see people from all over the world marching in the street you think, I want to be part of that. I want to be on the right side of history. People realise it is something that is happening all around the world and that really drives them to be a part of something.

'Cool' was a term often mentioned by both climate strike leaders and teachers. Oliana suggested the climate strikes were "something 'cool' to go and do with your mates." She felt the mounting popularity, in itself, helped to positively grow the movement. Oliana explained how the size of the movement with like-minded youth motivated her to become more personally involved in the strikes, she noted the appeal of this type of action, stating:

> I went to the first strike as someone who wasn't a member at the time and I was surrounded by thousands of people who were similarly minded. That urged me to get more involved. I would like to think that happened to other people.

Oliana had previously volunteered as an environmental educator at a local primary school, and she said:

> It is a lot harder to convince people of all the science, all of the legislation and all of the 'lingo' we have to throw around. However, when you have got a really powerful 16-year-old girl doing this by herself, and then being joined by a school, and then thousands, and then by millions globally, I think that is a lot more appealing to youth than an essay or press release.

The teachers also considered the inspirational nature of a popular global movement to be a motivator. For example, Tim suggested that "once you have a critical mass, everyone wants to participate". Lizzie also indicated, "it was the joy of that collective mind and joy of connecting globally" that inspired youth to strike. The ethical nature of the movement quickly became fashionable, thought Kathy, and this added to students' motivation, as she noted that "a grassroots movement like this starts with people doing the right thing and gains power and gains traction because it's cool and interesting."

Conversely, there were negative connotations to climate strikers being environmentalists and according to Jake, they were perceived to be 'tree huggers'. Acting deputy principal, Ava, observed that "some thought it was uncool, that sort of uncool, looking like a hippy" and this deterred students from attending. Josh felt ostracised at his rural school, stating "it is not necessarily cool to go and strike for the climate (Laughs) Yeah, not there anyway." He acknowledged this may not have happened everywhere, saying that "I know of other areas where attendance was much higher because everyone cared". Jake, who also attended a rural school, expressed similar sentiments, indicating "I felt a bit marginalized in my school for thinking alternatively and being interested in different things than just rugby." However, the increased popularity of the strike movement offered a voice and greater acceptance for individuals who may previously have felt marginalised. Jake stated:

> A lot were students that would never really have had a voice at my school. You'd see the library prefects, for example, and they're always sort of marginalised as weird students or whatever. But they now have an avenue to put all that energy into and that's why a lot of students were encouraged to go. I think more so once the ball got rolling, people were more comfortable talking about it.

The ‘cool’ factor, however, possibly obscured the important issues, thought Catherine, who stated:

> People were motivated because it was cool to go, it is cool to fight for world issues. But how much of that perceived coolness is because of the issues themselves or because of the branding, I am not so sure.

Nonetheless, Mary, like Jake, felt the growing popularity emboldened others, saying “as soon as one of the more popular kids says this is a cool thing, then they think this is not just a nerdy thing to do”. Strike organisers endeavoured to promote the message that striking was a ‘cool’ thing to do. For example, Madison said, “we put a lot of effort into designing the posters and making it look like a really cool event, while also keeping it educational”. Youth were motivated to strike by seeing other like-minded or popular peers or role models eager to participate. The strike leaders' insight into adolescent behaviours meant they anticipated that once numbers hit a critical mass, those who were initially uninterested would become more attracted to the movement or at least be inspired to learn more about climate change.

The ‘coolness’ or current popularity of sustainable action went beyond the strikes to have an impact within schools, suggested Kathy, a teacher who coordinated an environmental group. She said “politically, I am the number one cool person at the school. It's a cool thing for schools to be doing now”. The mounting popularity of the strikes encouraged greater national awareness and for some, this led to increased tolerance from both individuals and schools who may have previously condemned the movement as well as, potentially, greater participation. While many were inspired by crowd behaviours, others were motivated by those who were prepared to stand out from the crowd and publicly take a stand on climate change. This action contributed to the next motivator, that of curiosity.

4.3.8 **Curiosity**

The final motivating theme to emerge from the interviews was curiosity. This motivator was suggested by four climate strike leaders and one teacher as a potential reason for climate strike participation. Curiosity may have stemmed from witnessing activists and intrigue with activism or a desire to learn more about climate change, prompting participation. Flora was 15 years old at the time of the strikes and while environmentally conscious, she did not consider herself an activist As she explained:

> A lot of people were interested in the experience because I know many kids had not been part of a protest before, including myself. But I was interested to go along and learn more. I was hoping to learn more about how New Zealand is dealing with climate change and what they can do about it.

Simon, the strategist campaigner, used curiosity as a lure, "by creating a protest that would be in their face and seeing it on social media, they may be more interested in it and may be more curious about it." This seemed a successful strategy, he said, as "the first strike we had relatively low attendance, but the second strike we had thousands of people." Deputy Principal, Kowhai also felt that, "some students went out of curiosity, wanting to find out, what is this all about." Such curiosity shows a willingness for new learning and potentially new behaviours. It is considered an educational attribute and could arguably be positively nurtured to increase motivation towards climate change education.

In summary, the key factors that motivated youth to engage and participate in the climate strikes included:

- prior knowledge about climate change
- the emotional journey from apathy through awareness, anxiety, frustration and anger to action
- friends, youth-led movement, role models
- being part of a global, fashionable movement
- making-a-stand
- curiosity.

These factors depended, in part, on the level of contextual influences of climate strike leaders such as family support, school support, gender, and socio-economic wealth of the community. Such factors can influence the level of motivation and subsequent engagement with climate change action for students. An exceptional number of students, in 2019, were motivated to leave their classrooms to participate in the climate strikes, highlighting their concerns regarding climate action. Many, however, chose to stay at school. The reasons and motivations behind those who choose not to strike are discussed in the next section.

4.4 Why students chose not to strike

Many students chose to stay at school rather than strike. By recognising and considering the motivators that kept students during the climate strikes, there is the potential to extend

educators' understanding of students' engagement with climate change education. Both participant cohorts were asked why they believed students chose not to strike and a number of issues were identified including:

- Friends
- Authority figures
- Academic success
- A lack of understanding of climate change
- Inaccessibility.

These are discussed next.

The influence of friends, as previously identified as a motivator to strike, was equally a determining factor for some students who chose not to attend the strikes. Simon indicated the importance of attending with friends as validation of your actions, because "it is about having support and being recognised you are doing something." Moana encapsulated the comments of many when she said simply, "if their friends weren't going, they didn't want to go by themselves."

Authority figures such as parents, teachers and the school's senior management, further influenced students' decision to not strike. Aroha felt, "when parents say I'm not going to write you a note to go because I don't want you to go, I think that was a big part of it". Some may have been torn between respect for authority figures and their personal values, suggested Flora, who asserted:

> It just depends how much they value every day schooling as well as what their parents and school said. Some felt a little bit trapped, because everyone they looked up to, their parents, teachers, siblings, were pressuring them not to go.

Jake also thought many had to consider their values, saying "it's a balance of their parents' influence and their own morality, which might have to be questioned and they are two very uncomfortable things". Many felt great unease, suggested Marama, at the thought of going against authority figures, particularly as their actions "came from a place of fear… mainly from what I have seen from other people. Other schools were not allowing them, or their parents not letting them was a big one as well. Fear of authority figures". These comments suggest the ongoing influences authority and adult expectations have on youth and the emotional juggling that may be required for youth to balance their values with their future and societal

expectations. Some students felt they had to decide between demonstrating concern for a long-term climate-altered future or the reality of impacts on their short-term, immediate future. This leads to the third factor that contributed to non-attendance - that of academic consequences.

Concern for their academic success was suggested by Josh as a reason for not striking, as he said, "There are a lot of students quite worried about their grades," and this is why they stayed at school. Mary's friend told her, "I can't come because I have a chemistry test". Tina also suggested students may not have attended the strikes out of concern for their immediate future, stating, "kids are scared that they won't be able to go to 'uni' because of this and it will affect their future." The importance of education for future aspirations, particularly for those disadvantaged, was cited by Oliana, who stated:

> If your parents see your education as your pathway out of poverty and perhaps your prefect badge increases your chances of a scholarship, and schools are threatening or leaving it grey in that area [as to] whether they will remove prefect badges (as some have), parents will not be supportive at all of them doing that [protesting].

This comment also alludes to the disparate opportunities available to students from lower socio-economic communities.

While the teachers discussed attendance rather than academic ambition it still implied the motivation to do well at school. Kathy, Stella, and Ava indicated "they didn't want to miss lessons", as suggested by Stella. Ava also felt, "a lot more would have participated if it wasn't for the attendance issue. For those who felt the pressure of the school day were concerned they were missing classes or assessment." This saddened Ava, who thought her school should have done more to accommodate this issue by deferring assessments and supporting the students' need to strike to increase the understanding of climate change issues. These comments indicate a narrower perspective of what constitutes learning opportunities from unsupportive schools.

A lack of understanding of climate change was cited as a possible reason for non-attendance by both strike leaders and teachers. Oliana expressed concern that "it does come down to education and [those who didn't attend] purely not knowing enough about the climate crisis." Catherine also felt, "a lack of knowledge or empathy for some," would reduce the motivation to strike. The broader concern of climate denial was suggested by Huia, who stated, "I think there is generally a spectrum of climate denial and on the near end, it's an issue, but I don't need to do anything about it". These leaders imply that with greater understanding of climate

change, the non-strikers would be more compelled to strike. This idea was also threaded through the teachers' comments.

The climate strikes lacked relevance to some of the students' lives, suggested Kowhai, affecting attendance, because "they didn't know what it was about, and they didn't know how it affected them and their own little world. It came down to a lack of education more than anything". For Stella there was a "whole raft of reasons… some don't agree, we have some that don't believe in climate change - a few." Climate strike leader, Lajos, argued that climate deniers are in the realm of the older generations, stating that "climate deniers come out at me, but I have never met a young climate denier. I probably met most of the vocal climate deniers in this country, most are retired or 40, generally men, mostly white dudes". Arguably these deniers may influence the views of their offspring.

Finally, and perhaps most importantly, inaccessibility in both a practical and cultural sense impacted participation. For example, Aroha explained the logistics of getting students together in a large rural area as challenging. Similarly, Lajos explained the complexities of accessibility in a substantial urban area, stating:

> I think there were huge barriers for low income and low decile kids to get there. That being distance to the central city where we had the strikes and also culturally, I think in Māori and Pasifika cultures there is a stronger emphasis on obeying authority... we tried to break down as many barriers as possible for people living away from the strike location. We moved our meetings out to their area and hired buses to get kids from their school to the strikes and by paying for hundreds of train tickets.

Lajos acknowledged that clumsy planning for the first climate strike date resulted in a clash with the Pasifika Festival. Oliana also commented on this oversight:

> With the first one it started with central Auckland schools, it was also on the same day as Polyfest so that immediately excluded so many communities, especially communities that are on the front line of climate change, seeing sea levels rising and ocean acidification. But the second one was slightly better; it wasn't completely diverse, and neither was the third one but the third one had representation from the South side which is primarily where a

> lot of Pacific Islanders live. We had prioritised them, finally, going into organising the third strike.

Oliana went onto explain the cultural disparities that may have negatively impacted Pasifika students from participating in the climate strikes:

> People from higher decile schools have the resources and time to educate themselves and if they are not already getting this education from within the school, which I know some of the central schools are… not my school unfortunately. They have the time to not go to school and the privilege to choose to not go to school. Because education is a massive, massive part of Pasifika culture especially when past generations made a lot of sacrifices to get people into the schools they are in now. To choose not to go to school is seen as disrespectful and ungrateful. A lot of people are relying on their high school education to get into university so it was a matter of knowing what privileges were involved to actually go to the strike and help to break it down a little bit more for the third strike. But there is still a long way to go.

The students who were culturally and/or physically disadvantaged during the climate strikes are also likely to have experienced disadvantages within the education system. They may therefore respond to different motivational strategies. Considering approaches to climate change education that deliver equal opportunities and enable youth agency for all is vital if the aspiration of climate change education is for meaningful, equitable and systemic change.

4.5 **Chapter summary**

Exploring the motivation and engagement behind students striking for climate action was a guiding question in this research. Major factors identified by the strike leaders and teachers included an awareness of climate change; friends, a youth-led movement, and role models; their emotional journey; making a stand; the popularity of the movement; and curiosity. Those who chose not to strike were often considered to be influenced by a lack of climate awareness, parental values, school discouragement, or academic priorities. Experiences differed depending on the school policy and school leadership styles, indicating the significance of leadership for climate change education efficacy. The strike leaders who were unsupported by their school, found tenacity in their pursuit for action but suggested many others would have been discouraged by the school's stance. Those who were supported to protest by their school were

empowered to independently research the climate crisis, which led to enhanced political agency.

All participant strike leaders and teachers identified heightening awareness of the climate crisis as one of the important motivating factors. This suggests increasing an understanding of climate change should be a priority for engaging youth. Friends, role models, and youth-leading youth was considered the next most prevalent motivator with all strike leaders and half the teachers indicating this motivator. Pedagogies that value youth collaboration, collective problem solving, and facilitation of youth leadership opportunities may further boost engagement.

Emotions were deemed to both motivate and disengage. The emotional journey experienced by strike leaders revealed high levels of distress and anxiety among youth as their awareness of the climate crisis grew. While managing and ameliorating eco-anxiety is a growing concern for educators, many strike leaders indicated it was their anxiety and frustration that drove them into political action. Concern for the lack of eco-anxiety among students was raised by two teachers, one who taught in a rural school, the other in a low decile, predominantly Māori school. This implies further challenges for climate change educators with engaging students from agricultural communities and low socio-economic communities. It was suggested that the priorities and values for these students may differ from urban, higher decile schools and therefore engagement strategies may also need to differ.

The climate strikes enabled students, many of whom had no previous political interest, to make-a-stand and as Simon said, "validate" their concerns. This was considered a motivating factor by two-thirds of the strike leaders and half the teachers. Youth, who were too young to vote, appreciated the opportunity to have their voice heard on the political stage. As the strikes progressed, the global media groundswell cultivated an upsurge in the strikes' popularity, encouraging others to join the movement and "be on the right side of history," as suggested by Lilly. Curiosity, the final motivating factor, was implied by four strike leaders and one teacher. This factor encompassed interest in learning about climate change and/or political activism and processes. Being curious was the galvanising factor for their first strike indicated three of the climate strike leaders, and they believed, for many other students.

Previous research has identified that as young adolescence ego-centric needs increase, their concerns for environmental issues decrease (Eames et al., 2018). This may be evident in the classroom, yet the climate strikes witnessed an outpouring of adolescent concern for climate change. Of interest for this research was exploring if and how the concern in action translated

into meaningful learning as recognised by the *New Zealand Curriculum*. These learning outcomes are reported on in the next chapter.

Chapter Five: Findings – the *how*

5.1 Introduction

This chapter presents findings that reflect the learning experiences and learning outcomes from climate strike participation and considers how students became engaged and how educators may further engage youth. The findings associated with media sources, key competencies, school systems and pedagogies, along with climate change educational content are outlined. Finally, this chapter presents the findings on barriers to climate change education.

5.2 Learning experiences of strike leaders

The strike leaders all reported intense learning experiences that they considered developed understanding and useful life skills. For example, Marama's comment "oh my gosh! I have learned so much in the past year", was typical of the climate strike leaders' reactions. Twelve of the fifteen strike leaders indicated little or no formal environmental education at their school but felt the skills and outcomes of the *New Zealand Curriculum* were cultivated by their experiences as strike leaders. Lilly expressed, "being in the environmental movement makes you realise just how much they don't teach you in school, actually really valuable life lessons they just don't teach you in school." Most teachers supported strike leaders' perceptions and observed strike leaders as well as many other participating students learning from their experiences of the climate strikes.

Strike leaders indicated their learning included:

- Increased environmental and climate change understanding
- Increased understanding of democracy
- Increased understanding of local and national governmental processes
- Increased understanding of history, colonisation, neo-liberalism, and activism
- Improved critical thinking
- Improved leadership skills
- Improved public speaking and communication skills
- Managing and maximising working with mentors
- Learning about the role of police, working with police and the New Zealand law
- Working with teams and being individually bold
- Managing people with differing viewpoints, learning to value different perspectives
- Working with health and safety requirements
- Learning to strategise effectively

- Financial skills
- Learning to prioritise
- Increased knowledge and inspiration to make lifestyle changes
- Increased sense of power and agency.

When 15-year-old Aroha attended her first climate strike with a friend, she attended mainly out of curiosity and had no intention of joining the leadership team but was inspired by her experiences. When the school Strike 4 Climate floundered in her area because of a lack of leadership, she "stepped up and stepped in", taking over the leadership role. Aroha explained the skills and knowledge she felt she gained as a result of this experience, stating:

> Learning way more about the environmental stuff and what you needed to say. [About] Health and safety protocol, working with different groups of people, learning about the policies you need to know to hold an event. Learning a lot about organising events, working with people on a national and local scale, learning new leadership skills. Learning how to work with Government and speak with them and the best way to encourage people. For example, in a large and rural area, we couldn't do the same encouraging as they did in Auckland because in Auckland they had speakers talk about how farming was a huge issue. It obviously is, but we didn't want to go into it here because there is a huge population that are farmers and they can see it as blaming them and it isn't all their fault. It was learning all that technical stuff as well as about people. It was good though. It was great skills for me to take into the future and great learning about how to get your message across instead of just trying to yell at people about it…
>
> Outside of the strikes we partnered with a group to deal with an oil rig. It was right before the COVID stuff so it wasn't as big as it should have been, but we got that shut down. That kind of thing shows we can make a change.

Elevated organisational and communication skills were cited by all youth leaders. For example, Oliana explained:

> I learned how to talk to people from different backgrounds, including adults, learning how to address them, how to pitch myself to the media, learning how to organise a lot of people on very short notice and how to prioritise things.

Learning how to take and respond to criticism was mentioned by a few leaders. For example, Huia stated:

> There was a little bit of backlash after the strikes in regards to inclusivity and diversity and I was in charge of that. That was quite hard because I thought I had done the best I could, but I learned how to take criticism.

The environmental learning spectrum ranged from big picture policies to small day to day actions, as Jake explained:

> So I learned about the greater things like the big strikes and the changing government. But I also learned about small things which I'd never considered like, I always thought vegans were going to be this strange breed of moss-eating jungle people. But then I met so many of them and they talked and I had no idea about animal agriculture… So I learned things on the whole scale from small stuff, like, you know, like wax wraps and stuff like that to vegan food to more things like the 'Green New Deal' and really systemic stuff.

The strike leaders' historical understanding was also increased. As Madison commented, "I learned the whole concept of colonialism and how that affects literally our whole day to day basis."

The increased understanding and skills gained were perceived by many participants to have practical future applications. Catherine recounted she was 15 years old when she became involved with the climate strikes. She said:

> The strikes have opened up a lot more doors for me than I ever thought I could open. I guess it has taught me more about myself and how I want to navigate through life.

Leading the climate strikes transformed the learning experiences of many, as summed up by Lajos, who said, “I learned more last year, in the year I attended school the least, then any other year I attended school, and I am one of those who love school”.

The teachers' perceptions of student learning focused less on the specific skills gained and more on empowerment and political agency. Ava described the learning she witnessed was “huge, really huge”, and stated that:

> The two students who led the strike were invited to a Council Meeting to speak to our local council, which was the exact action they were hoping for, so that was fantastic. We had media involvement, we had a nationwide reporter… they felt very heard and acknowledged and seen.

Many of these skills could have been learned from leading any protest action. However, the climate strikes offered ‘high stakes’ contextual learning. They were youth-led, with large participating numbers, a global scale, global publicity and may have had a bearing on their climate altered future. The personal stakes were very high. Most of the climate strike leaders admitted to being highly driven and motivated students before the climate strikes. I questioned what learning may have taken place for those students who were not leaders but attended the strikes who were possibly less engaged or disengaged with activism or the climate crisis prior to the strikes. The perceived learning experiences of those students are reported next.

5.3 **Perceived educational experiences of youth strikers**

The students who attended the strikes were considered to have increased both their environmental knowledge and their political agency, according to most strike leaders. Some suggested the shifting levels of knowledge may have encouraged students to greater critical thinking and personal reflection on both personal and planetary issues.

The climate strike organisation identified goals that included raising general awareness of the climate crisis and pressuring governmental action. To this end, the strike leaders aimed for the strikes, “to be equal parts educational and equal parts motivating,” said Madison. Moana gave more detail on what strike participants may have gained, stating:

> They learned a lot. Not just about climate change and the things that they heard from speakers talking about how they can make a difference and protests, activism movements, and grassroots

> movements. But [they] also just learned a lot about being in that kind of environment. We gave out pamphlets and put a lot of stuff on social media about how you deal with people who are trying to come there to counter protests. How to deal with the media if they talk to you, what your rights are with the police and law enforcement. I think [they would] learn at least one of those things.

Throughout the strikes, they offered "little nuggets of information" about climate change. Lilly and Lajos, who talked about the expert speakers, indicated "we had climate scientists like Jacob Anderson who were really trying to teach huge crowds the stuff they should be learning in schools." The exchange of climate change information was delivered multiple ways according to Josh, who stated:

> We had a panel with a lot of experts as well as politicians, councillors and a very small number of business people. There was definitely a lot of information available. As well as that, when people find themselves willing to go on a strike, they are also likely to read up on what they are doing and quite likely to follow some environmental groups on Facebook or Instagram and through that as a sort of chain of events.

Many strike leaders anticipated the 'nuggets' of information youth gain from general publicity or as a result of attending the strikes would encourage further, independent research. Mary, Josh, Jake, Ciara, Ella, Simon, Aroha and Oliana all stated they were motivated to learn more after attending the first climate strike in March. As mentioned by Marama, "it is really interesting how much an event like that can move people into doing their own research." Even those who did not attend the strikes may have been motivated to research further, suggested Oliana. She stated, "kids who didn't come, would be thinking why are these kids in the streets and missing a day of school and what is the reasoning behind it, that sort of thing." Furthermore, there was a groundswell of understanding, indicating that the strikes could change perspectives. Flora said, "I know a lot of people really changed their viewpoints. They then became the people who were going because they cared for the issue rather than just following along." All strike leaders indicated participants were likely to have increased their understanding of environmental and climate change issues if they attended the strikes, moreover, they believed attendance was likely to have increased their political awareness.

These experiences were potentially empowering for students suggested Mary, because "they learned their voice had a lot of power and they were inspired, they realised they were able to make a difference by becoming politically active and sharing their knowledge. They realised 'I am able to take action like this.'" Oliana felt others may have had similar experiences to her, and stated "they learned that you don't have to be anyone special to get involved and to do something about what you care about." Students may not have felt their voice mattered or would be heard individually, but through the strikes they gained an understanding of the power of a collective voice. The collective experience of the strikes may have empowered and supported students no matter what their prior level of commitment to climate change had been. For example, Catherine stated:

> I think lots of people who had the knowledge before would have felt empowered. But as for the people who came along just for the sake of coming along, I'd like to hope they learned there was a community out there that was ready to support and talk through this stuff with them... it is a pretty provocative atmosphere, it makes you question stuff.

For some, this experience could guide individuals into more critical thought and personal reflection. Lilly indicated:

> Something that a lot of young people are trying to figure out is what their values are and what they stand for, so I think that [being at the climate strikes] helps you. If you hear people saying their opinions and putting it out there, once you have the facts you can cast your own judgment I guess, and figure out what your values are.

The strike leaders viewed the climate strikes as a successful tool from which students had the opportunity to increase their understanding of climate change and political processes. This, at times, was believed to empower, increase personal reflection of their values, and enhance critical thinking.

The teachers, when asked what students may have learned from their strike experiences, offered less detailed responses. However, they all agreed the strikes were potentially educational, particularly for awakening political consciousness. Nathan suggested, "they definitely learnt about the power of their voice." Stella reported the learnings were not only evident with

students who attended the strikes, but also for some who stayed at school. She found the climate strikes instigated dialogue within the classroom, "we had lots of chats about personal freedoms and the right to protest," she said. These discussions promoted further thought. For example, Kowhai indicated that "it created discussions, I know in my class it did. It had more questions than answers for them, they were thinking of their future - future focus." Other than incidental conversations about climate change and political agency, there was little evidence that teachers used the climate strike specifically as a learning opportunity.

The climate strikes provided learning opportunities for students. Their experiences with the movement, and whether or not they participated in the strikes, had the potential to enable greater understanding of climate change issues, political agency, student voice, and critical thought. The strike leaders signalled that many of the skills and understandings gained from participation in the climate strikes provided valuable climate change understanding and real-life skills that should be developed in secondary schools. Few schools, however, provided comprehensive climate change education, therefore, most students relied on information gained from media sources.

5.4 **Media sources**

The information sources from where youth access their knowledge on climate change indicates the depth and integrity of the knowledge they are receiving. Climate strike leaders were asked where they believed youth primarily got their information from and if they considered the source reliable.

All leaders suggested social media was a primary source for most adolescents and many considered this source untrustworthy. Instagram was most frequently cited as the first choice for youth, while Facebook was considered the domain for older people. Mainstream News was considered the preferred choice for those who required more in-depth and reliable information. Three climate strike leaders indicated their initial information and interest was derived from school, two others suggested school would ideally be the primary information source for students but they had personally "learnt nothing" from school.

For many youth, social media was considered the information source that was most likely to initiate interest with youth. The specific media platforms, suggested Aroha, were "Instagram and Facebook plus the shows we watch on Netflix and YouTube." Aroha believed social media was a valuable starting point, "if they have an interest in it, it gives them enough information to interest someone and do more research themselves. Which in my opinion is the best amount of information really."

When it came to knowledge gathering, the climate strike leaders often separated themselves out from the general youth population, suggesting their zeal encouraged research beyond social media. For example, Jake said "no one is reading the books I am reading". They searched news feeds, conversations and original scientific and government documents. Mainstream news media was considered more reliable for accuracy, because "their job is to inform people with timely and accurate information," said Lilly. Huia preferred what she called 'trusted' sources and started her knowledge gathering by:

> …reading United Nations reports but that's quite a high academic text, I didn't read the whole thing because it was too inaccessible and draining. It was like omg! I read the summary for policymakers. But [my understanding] developed further by talking to people.

Oliana's experience of scientific sources was initially daunting, because she "didn't at first understand a lot of the language that was used because it was all climate science and limiting." She persevered and found she became a conduit, stating that she "relayed it back to my friends who had questions about it as well."

Social media was used advantageously by the strike organisers. For example, Marama recalled, "we liked to circulate a lot of information through our social media about what the government is doing and everything like that to help get more people involved."

Disillusionment with the integrity of social media was also frequently mentioned. Jake suggested, "it might be a stretch to call it knowledge sometimes", and Catherine explained:

> …people write posts themselves that are shared so it is hard to track the source… the information from social media echoes what they believe so there is nothing out there that say go look up something else. If you have little sound bites that seem true I don't think people are going to go and look it up.

Having social media as your main source was considered "dangerous" by Josh and Simon. Even so, Josh acknowledged, "it is the main way to get the message to the kids." But Catherine felt that if she could change the way people got their information, she would. She stated:

> Although it works really well to get people to listen to the environmentalist point of view [through social media] it also

> works really well in the other direction. I guess the more right wing conservative point of view is echoed well on social media. Ideally everyone would get their information from a reputable source.

The individual bias associated with social media compromised the impartial and trustworthy nature of the source. For example, Jake stated:

> It's all individual because of the algorithms, which make up your social media. It sort of depends on the person because I know that someone who's not involved in the strikes and is probably, possibly anti-strike is going to have a social media feed which reinforces that idea.

The mechanics of social media did not encourage critical thought suggested Lajos. He stated, "I think it's always dangerous when you are allowing this free market of ideas, social media, where it just happens to be whatever platform has the most hits, or whatever happens to go viral is what gets cared about or what gets learned about." More traditional sources of information were often considered preferable to social media.

Traditional newspapers, the News generally, and radio were considered more reliable sources for youth. According to Lilly:

> The News probably gives quite accurate information, their job is to inform people with timely and accurate information. *Stuff* [a news web and online paper channel] has been really good they have been putting out great columns and they have the climate change section.

The downside of general media, however, was it 'lacks urgency'. Jake described students' preferences:

> …if not from social media, they tend to be getting the information from News. I think a lot of students like The Spin Off, things like that, it's not all mainstream news. There's Double Down news, there are news outlets where students who are interested get all these perspectives, which I'm getting through my books. So that is

> still access to it, but generally students are probably still getting their stuff from just headliner articles.

The perception that many students lacked the motivation to conduct in-depth inquiry into trustworthy information was not necessarily the fault of students, from Marama's perspective. She stated, "we know it is a massive problem, but we haven't had the resources or the capability to find out more and know what to do about that exactly." These comments suggest that for students not inclined to personal research or inquiry based learning, social media is the most accessible platform for information, if, that is, your logarithms show you have an interest.

The lack of climate change or sustainability education gained from school was frequently mentioned. Flora's response was typical. She stated, "they thought if you were an environmental person, join the group and help out to clean up around the school, but they didn't educate us on what was happening to the planet." In response to there being no sustainability education at her school, Tina established an environmental group because she felt, "it is important to have it [climate change education] at school because on social media they say things that puts a lot of pressure on people that may not be true or official." Catherine also felt youth had the potential to be overwhelmed with information from social and general media. She said, "that is why I think it is so important to be taught in schools because they can be really specific about what they teach people, how much they teach and make sure the information is accurate." Three out of 15 students identified school positively as an information source, perhaps indicating the level of sustainability education currently happening in schools.

The teachers were asked what climate change education was offered at their school. Five out of the eight participant teachers said it was non-existent, or in the form of an extra-curricular environmental group driven by one or two passionate teachers within the school. Kathy and Stella referred to the environmental education component that fell under the Social Studies curriculum (Ministry of Education, 2007b). Teachers with environmental sensitivities, according to Stella, were sometimes approached by students "wanting more information about climate strikes." These comments indicate the ad hoc nature of sustainability or climate change education in secondary schools.

Overall, social media was considered an unreliable but prevalent source for climate change information for youth. The strike leaders and teachers unanimously argued formal schooling should reflect the future focus nature of the curriculum and offer climate change education. For example, Oliana stated, "it is such a massive part of what our generation is dealing with now and will be dealing with in the future, I think it is very important we learn about it in schools."

Frustration at current schooling was evident, as expressed by Lilly, who indicated that "being part of an environmental movement makes you realise how much they don't teach you at school. Valuable life lessons, they don't teach you." Lilly's comment might surprise some adults. The document analysis on the formal online media surrounding the 2019 climate strikes showed people who were unsupportive of the strikes argued that classroom education is where students learn for their future and this type of education should therefore take priority over everything else. Conversely, those who supported the strikes considered the significance of the issue and saw educational value in students being politically active.

5.4.1 **General media representation of climate strike action**

Online media reported the opinions and perceptions of politicians, strike leaders, students, principals and the general public. Politicians who were publicly supportive of the strikes included James Shaw, co-leader of the Green party and Minister for Climate change, he was frequently quoted as supportive of students leaving the classroom to strike for the climate. For example he said, "there is an element of anger that the speed of change that is required is not being lived up to and I have to say I agree with them" (Shaw, 2019). Other notable and supportive politicians included Prime Minister Jacinda Ardern who thanked students for their efforts and told a live debate at Wellington East College not to underestimate the power of their voice (Smallman, 2019). In Ardern's 2017 campaign speech, she used inclusive language suggesting climate change was "my generation's nuclear-free moment" (Ewing, 2017) and by doing so, identified as a member of the younger generations. At the 2018 Climate Change Summit in New York, Ardern's keynote address spoke of the need for optimism, suggesting pessimism led to apathy;

> You may well argue that, based on our current trajectory, now is not the time for optimism. But if we only talk about the loss of glacier mass or sea level rises we run the risk of a society that believes all is lost and that it is simply too late… it is not (Roy, 2019).

A Twitter comment from Clarke Gayford (Prime Minister, Ardern's partner), television and radio host, on the day of the first strike in March, acknowledged the challenges students might face, he said "get bloody stuck in today kids. Wear any punishment like a badge of honour" (Small, 2019). Labour and Green party members were the politicians most likely to support the strikes. Chris Hipkins, the Minister of Education, for example, linked participation in the strikes with learning outcomes, he said, "I want kids to be learning. If taking part in this action is part

of the learning process, then there may be some merit in it" (Radio New Zealand, 2019a). Similarly, Phil Twyford, Labour Minister for Economic Development applauded youth action by saying, "if there's one issue that's going to affect the next generation it's climate change – these kids are smart, we are dealing with their future" (NZ Herald, 2019b). Megan Woods, (Labour Minister of Parliament who held the energy and resources portfolio as well as research, science and innovation), Eugene Sage and Chloe Swarbrick, (both Green Ministers of Parliament), were vocally supportive of the strikes and on 24th May climate strikes, on the steps of parliament, accepted a list of demands from strike leaders. Prominent academics and scientists also publicly expressed their support. Two days before the first climate strike on 14th March the *NZ Herald* published an article outlining support from 22 academics or scientists and their reasons for supporting the strikes as well as the significance of the strike action (Morton, 2019).

Politicians who publicly denounced the strikes often questioned the motivation and value of the climate strikes. These politicians usually belonged to political parties that lent towards right wing politics. For example, the opposition National Party leader, Simon Bridges acknowledged the seriousness of the issue, but suggested students should hold their strike on the same day as the impending teacher's strike or on a weekend (NZ Herald, 2019b). Nikki Kaye, Education spokesperson for the National Party said government ministers should not be encouraging the strikes. Judith Collins, National Party spokesperson for Infrastructure, Housing and Urban Development stated, "their little protest is not going to help the world a bit" (Radio New Zealand, 2019a). Furthermore, she showed an astounding lack of understanding of climate change by stating the strikes were "a generational thing and the future youth will have something else to worry about". The leader of the ACT party and deputy Prime Minister at the time of the strikes, Winston Peters (New Zealand operates a MMP electoral system), said in an interview on Radio New Zealand that he did not support the strikes and felt students should instead be focusing on their education (Peters, 2019). News reporters Duncan Garner and Mike Hoskings were loud critics of the climate strikes. Garner's opening comment read, "yes, it's the strike for the climate – an international movement. How trendy" (Garner, 2019) and like Simon Bridges, Garner suggested students should strike in their own time. Mike Hoskings, a popular morning radio host called the climate debate farcical and that while the issue was important it had been hijacked by extremists. He said the climate strikes were nothing more than;

> Entitled kids bunking off and pretending they're fixing a climate issue. It's bad enough they have deluded adults like the Nelson and Christchurch Councils

> declaring climate emergencies. A move just about as useless, pointless, and wasteful as taking a day off school to chant with a large bit of cardboard painted with virtue signalling slogans (Hosking, 2019).

Behind the rhetoric from the adults who did not support the strikes was the idea that education can only occur on school grounds. This perception was rejected by strike leaders who believed participation in the climate strikes led to significant learning outcomes, increased knowledge and skills for them personally and for others who participated and aligned well with the *New Zealand Curriculum's* key competencies.

5.5 The key competencies

The *New Zealand Curriculum* states the key competencies are "the key to learning in every area" (Ministry of Education, 2007b, p. 13) , and are considered more complex than *just* skills. The key competencies draw on attitudes and knowledge encouraging students to be connected, confident, and actively involved in their learning (Ministry of Education, 2007b). Gaining an understanding of strike leaders' perceptions on the utilisation of the key competencies during the climate strikes will help to connect the learning outcomes of the climate strikes with school curriculum and potentially, adults' expectations. The strike leaders were asked to consider the five key competencies of thinking, using language and symbols, managing self, relating to others, participating and contributing, and discuss, if any were developed as a consequence of youth participating in the strikes. Marama's response was typical when she stated "Absolutely, Oh my goodness, it is just a summary of what participating in the strike actually is." Many strike leaders identified learning that could be related to each of the key competencies, and these are reported below.

5.5.1 Thinking

The key competency of thinking was considered to be frequently used by all strike leaders. For example, Lilly expressed, "if you are already at the strikes you are thinking for yourself, thinking about your impacts and thinking about and questioning what you believe." For Oliana, the thinking connected her personal concerns to global and political issues. She stated:

> In terms of thinking, I had to think about what I was contributing to society and started looking into our parliament and our leaders. I started thinking differently after I attended, because it pointed out to me the pure weight of the climate crisis and the direct link

> to the problems I was having in my own life. It was sort of like a catalyst of drawing politics to personal problems.

Critical thinking was commonly suggested by the strike leaders as an outcome of participation in the strikes. Thinking, they suggested, led youth to challenge their personal values, behaviours, question politics and seek more information.

5.5.2 **Using language and symbols**

Using language and symbols involves creating texts to "record and communicate ideas" (Ministry of Education, 2007b, p. 38), and was least mentioned by strike leaders. Ten of 15 strike leaders indicated students who participated in the strikes *might* have applied this competency. Simon gave an example, stating, "making a sign and making something that expresses your thoughts, you have to condense climate change into one or two small sentences or words or meme or anything like that." More extensive use of language in the climate strikes was suggested by Madison, who referred to "making signs, chanting, we also had petitions and a section to write emails to our city councillors and Jacinda Ardern [Aotearoa New Zealand prime minister at the time], I hope they were using language," she said. The experiential nature of the strikes may have reduced the apparent need for language and symbols. Nevertheless, using language and symbols was considered to have improved for those who felt empowered to make a Zero Carbon Amendment submission and when writing letters to politicians.

5.5.3 **Managing self**

For Mary, the students who had been managing themselves were thinking and acting maturely, because "managing self assumes you are not doing what you have been told to do, you are managing your own expectations of yourself and what you value. They [the students] had to manage themselves and get themselves there." For Oliana, managing herself involved some difficult decisions:

> Managing self, for me, made me consider what I needed to prioritise, especially when senior management were trying to stop me from going. As well as that we had education, we had Polyfest which is part of culture, a massive expression of culture for indigenous people, and then we had the climate crisis. So, three very important things that I had to learn what I wanted to choose between on that day.

All strike leaders indicated the key competency of managing self was actively used by climate strike participants who attended the strikes. The comments suggested that to manage themselves students needed to show maturity to independently make choices, prioritise and consider the consequences of those choices. These skills clearly reflect the vision of the curriculum to be "actively involved, confident and connected learners" (Ministry of Education, 2007b, p. 7).

5.5.4 **Relating to others**

Relating to others was considered one of the most obvious key competencies generated from the climate strikes for youth. Jake said, "it was great to see that we all came together under this one thing, but there were also so many factions of it." Here Jake suggested that individuals may have related to others at the strikes who were like-minded, but interestingly, they enjoyed the opportunity to meet a diverse range of people. This concept was suggested by Catherine, who stated:

> The strikes put you in a different situation than schools. By going on a strike, you open yourself up to so many different ways of thinking, so many different communities you are probably going to meet people who make you question yourself or who have had so many different life experiences to you.

Relating to others can encourage empathy. For example, Oliana stated, "people were able to sympathise and empathise with people who were on the front line of climate change that they didn't previously know about before." The attempt to relate to others outside your normal peer group, it was hoped, was reciprocated particularly when relating to politicians. Aroha explained:

> Relating to others, communicating with others, we were communicating a message to our leaders or our country. We are trying to relate to them, and we are trying to get them to relate to us and to listen to what we want and to listen to our voice.

The climate strikes enabled students to have an opportunity to relate to a far more diverse range of people than they would have at school and, in some cases, this led to greater understanding and empathy.

5.5.5 **Participating and contributing**

That student protestors considered the key competency of participating and contributing a 'no-brainer' stated Jake, this sentiment that was reiterated by all the strike leaders. For example, Lilly stated, "participating and contributing is something they are all doing." For many strike leaders they connected participation with contributing politically. As Madison suggested, "participating and contributing in a politically charged event, you know, what more can I say. You are participating in politics; you are contributing to change." This idea was reiterated by Aroha who felt, "we are contributing to a better New Zealand." This competency shows the future focus of strike participants who, by showing up to the strike, participated in an action and therefore contributed to the political and collective voice of youth demanding a more sustainable future.

The learning experiences gained from the climate strikes, argued strike leaders, were comprehensive and empowering, offering breath and depth of both knowledge and skills. Students' knowledge and understanding of climate change improved and so did their political understanding and agency. These learning experiences were considered inspirational, and in some cases, led to strike leaders questioning the power of authority figures and neo-liberalist economic structures. The 'real-world' context of the climate strikes provided learning opportunities that led to useful workplace skills. With this consideration, the next section reports findings around the pedagogical insights educators might gain from the strike leaders' learning experiences on how to better engage youth within the classroom.

5.6 **The *how:* School systems and pedagogy**

The findings presented here suggest *how* the implementation of climate change education is most likely to enhance classroom engagement. Included in this section is mandated climate change education, leadership, cross-curricular pedagogy, action competence and engaging the head, hands, and heart. This section also presents findings related to climate change educational content. These findings are categorised into: the science behind climate change, social justice, indigenous knowledge, and political agency. Finally, this chapter reports the barriers observed by teachers for holistic implementation of climate change education into their classrooms.

5.6.1 **Mandated climate change education**

James Shaw, leader of the Green party, stated that he supported a transformation of the curriculum that embedded climate change education into all parts of the school system (NZ Herald, 2019c). The strike leaders and teachers were asked their thoughts on making Ministry mandated climate change education. While suggestions differed on how that might look, all

participants, strike leaders and teachers felt that the integration of climate change in secondary schools was overdue. They used words such as, "Absolutely, definitely, 100%." Social Studies teacher Stella argued that "sustainability has to be in the curriculum. The government has done a great thing in bringing in Māori history, so why not the same with sustainability?" Some teachers, however, argued that the *New Zealand Curriculum* had already made provision for teaching sustainability, but it was the actual implementation that was lacking.

Not one of the participant teachers reported their school provided a satisfactory level of sustainability education, or specifically climate change education. The spectrum of enacted sustainability education ranged from mediocre to non-existent. At Ava's school sustainability education "doesn't really [happen]" and Tim reported "very, very, very, little,". Some participant teachers, however, reported observing an increasing number of subject areas that were more likely to include environmental understanding. For example, at Kathy's school, "the social studies department has changed dramatically and they have a lot of focus around conservation. The junior science department does tree planting as part of Year 9." Kowhai reported a student-led initiative at her school, stating "we have our [student] environmental committee that tries to impart practices." Susan, the only teacher interviewed for this study currently teaching climate change education, said "I started [teaching it] last year. To my knowledge, that is the first time climate change education has been taught at school. I would have been there a decade and there was definitely no mention of it in that time." Susan's class was the first climate change education to have occurred at her school in the past ten years. These findings show that some schools are awakening to the need for sustainability education and climate change education, but as reported by teachers, such as Tim and Ava, there are schools where there appears to be a disconnect between the perceived need for climate change education and the actual implementation of it.

This disconnect, however, was not necessarily considered the fault of the curriculum. Some teachers appreciated that the curriculum values did support the concept of ecological sustainability, but lamented the lack of priority and motivation within schools to implement it. For example, Nathan suggested, "we have a New Zealand Curriculum that is a really good document and it does allude to sustainability within that." Nathan later admitted to not considering climate change concerns when planning drama programmes, but went on to say "I think it needs to be on our radar with everything we teach, it needs to be in the curriculum as educators, it shouldn't be a one-off thing that we teach 'here'. It should be [part of] ongoing discussions. Everything that happens, we should be referring back to it." It is interesting to note that despite Nathan's passion for climate change education, he did not implement it. Later he

acknowledged he felt unprepared and under-resourced to apply climate change education to his subject. This is further addressed in Section 5.9.1, pertaining to barriers for climate change education.

Susan taught at a semi-rural school, and she suggested that greater teacher support was needed, not compulsion, as she said:

> It is hard to say anything is compulsory with our curriculum because it is pretty open compared to other countries, it is not very prescribed. It would be hard to pick climate change out and say it is compulsory when there are so many other things that are open. You would have to do a complete curriculum change for that. However, not so much compulsory but having more provision for more resources to make it more doable would be much better. More the carrot than the stick.

Some teachers reported feeling it a thankless and lonely task trying to cultivate sustainability education or climate change education in their school. Susan, like Kathy, Tim, and Stella have been harbingers at their school, encouraging and leading some form of sustainability education. Susan recalled what it was like for her, stating:

> I do feel a bit isolated, like a religious nut and they look at me and roll their eyes and I have got a bit paranoid about it, I see someone come for lunch and they divert off and sit somewhere else (laughs) and I think to myself, 'oh my goodness, am I a one-man crusader'? There is that worry that you switch people off, you know, 'there she is again on her climate change rant'. I haven't heard it [climate change] being mentioned anywhere else in school to be honest, I haven't heard a peep of it in meetings, it is just a non-topic.

The sense of isolation within the school, and similar despondency, was also reported by Kathy, who stated that "the way I view this… if you are working in a state school, there is not a lot going on that is very good for the environment…I am trying to change the culture without stepping on a whole lot of peoples' toes." These comments suggested, those who are currently driving sustainability education or practices in their schools, do so with little support, and feel they have to tread carefully to ensure acceptance of their efforts.

Interestingly, Kathy and Susan reported experiencing recent attitudinal shifts from the schools' leadership teams towards sustainable practices or climate change education. Susan's school recently appointed a principal who was driving context-based teaching by using real-life examples or experiences in education with a view to make learning more meaningful (Herranen et al., 2019). Susan now teaches a ten-week climate change class. This class is cross-curricular, enabling Susan to co-ordinate her science lessons with Social Studies, English, and Maths teachers. Likewise, Kathy, who facilitates an extra-curricular environmental group, was surprised to find "I am getting a lot of support at the moment - it is a very hot topic." Her school has also "applied to the sustainability contestable fund to get solar for the school," although the motivation for this was "to try and make the high school more economic." When asked in the interview for final comments, Susan added:

> I think a lot of schools, like ours, are on the cusp of pushing ahead. I think of how the picture looks at the moment - in five years time I suspect it might look quite different… The ones that are out in front, it feels, are a bit unsupported at the moment, I kind of feel things are happening but it is early days.

These comments imply a positive shift from some leadership in terms of their sustainability attitudes in secondary schools, but most participants reported little or no perceivable shift or action within their educational institution. The practices described indicate that the enactment of environmental education, as has historically been the case, is still only offered when it is driven by passionate individuals.

5.6.2 **Leadership**

The need for school leadership to support and drive climate change education was raised by many participant teachers. Five out of eight teachers described minimal or non-existent sustainability education at their school. Nathan, who worked at a large, high decile city school, stated, "It [climate change education] is not mandated at all, it's not something we talk about in curriculum committee for example, or informally with people… I think it should be front and centre of everything that we do." Nathan suggested that students need to continue to agitate the thinking and practices of both school leadership and those in power. He promoted action where people could, "go and talk to head teachers, go and talk to boards of trustees, talk to your local MP, talk to your local councillors." With pressure applied from the bottom up, top-down leadership was considered more likely to occur.

The strike leaders often expressed appreciation for their teachers and showed understanding of the constraints they worked under, showing a realisation that they were, at times, hindered by management. For example, Flora stated, "teachers at school are generally trying to teach us to express ourselves and figure out who we want to be, what we want to do, what we enjoy, what we don't enjoy… But I think the school had asked all teachers not to talk about it [climate strikes] in front of kids." Strike leaders who experienced obstructive leadership approaches had to deeply consider their values, consider the power structures and thereby gained the courage to challenge traditional authoritarian structures. While this outcome and student realisation may challenge the thinking and practices of those in offices of senior management, ironically, such insights potentially empowered students and increased their sense of agency. Allowing greater student voice and autonomy may drive leadership towards greater climate change education uptake.

Many teachers acknowledged that meaningful support for climate change education would have to be instigated and led by senior leadership. Kowhai, a Deputy Principal, confessed to not taking into account climate change as an important kaupapa (value or philosophy) at her school or in her classroom planning. Nevertheless, she suggested it needed to happen from "the top down...it should be something we are talking about at leadership level. As educators, we are really powerful and we can make the difference, but I guess it is about putting more pressure on 'up there', [the] Ministry [of Education]." Kowhai's comments typify the structural inertia reported by some teachers. While climate change education may not have previously been part of their paradigm or included in their educational discourse, the teachers interviewed understood the urgent and overarching need expressed by striking students for action but felt thwarted by a lack of support and leadership.

Leadership teams, as Kowhai suggested, may also feel stymied by structural procedures and expectations. It was suggested that for secondary school leadership to initiate climate change education, the mandate would most likely be driven at the Ministerial level. For example, Tim indicated there was a need to:

> Initiate it from the top-down, from central government… [They should say] we will come and inspect your school and see student engagement and civics and climate change and students brooding over our future. We want to see this engagement bubbling along and we want to see students coming out of your school who are well engaged, who know there is a problem and are willing to do

> their part and draw in their parents or maybe their whānau to create a populace, an electorate that will make a difference further on.

This idea was also proffered by 17-year-old strike leader, Jake. He stated:

> I think it's going to take something bigger and nationwide and really put out there for the Ministry of Education to be bold and say, 'right, everyone needs to know about this and we're going to start our classes, we're going to start to build a lot of infrastructure for lifelong learning about climate change.'

Alternatively, the Ministry will be compelled to take action as their clients, the students, demand a mandate for climate change. A bottom-up approach, as previously mentioned by Nathan was also considered a probability by Susan, who suggested that if it is not given the mandate it deserves, climate change education will be student-driven and leadership will be obliged to comply. She indicated:

> I think, like everything, the majority will come on board and the late bloomers will catch up. If not government-driven, the students will be driving it and saying 'hey, how come our school is not teaching climate change when my mates at this school are?' So, I think schools are going to be pushed into it, not necessarily by the government. I suspect students will demand that it is included in their education.

The climate strikes were a resounding display of students' concerns around climate inaction, and a call for climate change education. Strike leader, Marama, reported "I went to a conference with a bunch of different teachers last year and we talked about the massive lack of climate change education in schools." The online newspaper, *Stuff,* reported Jack Barlow, strike leader, calling for "bold leadership" (Hutt, 2019), a concept supported by Moana who identified the importance of climate change education as a key aim of the strike movement, stating, "that was actually one of our goals as an organising team was to try and discuss climate change education in schools and get it." These goals were followed up with actions outside the climate strikes.

Teachers, however, who are attempting to lead sustainability education and practices described their experiences as, lonely, lacking leadership, and lacking support. Nevertheless, some teachers perceived a small shift in attitude with leadership attitudes towards climate change education, and suggested it was only a matter of time until it became more mainstream. Further

to leadership support, the next consideration for *how* to best implement climate change education involved cross-curricular strategies.

5.6.3 **Cross-curricular implementation**

When strike leaders were asked how climate change education would ideally work in secondary schools, most talked about how it lends itself to a cross-curricular approach - teaching that applies across multiple curriculum subjects (Hayes, 2010). Strike leader Marama argued, "There are so many different subjects, pretty much every single subject, I could argue could somehow have climate change education in it and it is such a pressing topic, it should have it in it." Moana jokingly described how her teachers would utilise it to engage her, by stating that "my maths teacher would manage to involve the environment in some ways. If I ever looked distracted, he'd start making the problems about things to do with the environment." Likewise, Madison spoke of the attraction to cross-curricular implementation, suggesting:

> Educators must understand that environmentalism is very important for young people and it should be a part of the curriculum and integrated into normal subjects. If we are talking about economics, throw in something about the environment there, like what is sustainable in economics, stuff like that… It's just a matter of integrating it into what is already there.

The participant teachers also considered a cross-curricular application for climate change education, as a supportive and forward-thinking option. Kathy had some experience with cross-curricular approaches to teaching, and said, "I like working with the other teachers who are really enthusiastic because together we can tie a common theme into three or four different subjects." Susan, the only teacher interviewed who was actively teaching cross-curricular climate change in class, fully supported this approach. She advocated by exemplifying their practice, and stated:

> We are cross-curricular, there are four teachers, Science, Maths, Social Sciences, and English - we all work together. We are the only class that does that. When we plan areas, we plan them together, so as I taught climate change the social science teacher brought in their area, the English teacher brought in their area, so we had it together as a coordinated bunch and had a much stronger impact on the students. But as well as doing the project-based learning there were four of us working together, so it was pretty

> powerful. We have had more collaboration, we know our students better, the cross-curricular stuff for us really worked.

Stella offered an example of cross-curricular learning, stating "solar power in India for example, why not make it integral, so if they are an art creator, they are making art about it. If they are science they can be inventing things, that kind of thing. They want it, the children want it." Further to working cross-curricular within year levels, Stella suggested vertical collaboration throughout the school, indicating that:

> Logistics wise, this may be a nightmare but you could enable children to work cross-curricular across year levels as you do with tuakana-teina, where older children work with the younger, then we may have days where we do different things.

Tuakana-teina is a concept drawn from Te Ao Māori and considers the relationship and learning opportunities between an older person (tuakana), and a younger person (teina), and vice versa. Kowhai supported this concept, stating "I am really open as an educator to learn from the students". Utilising tuakana-teina may not only incorporate values from Te Ao Māori, it may also offer an understanding of greater interconnectedness, a concept increasingly considered vital for climate change education.

Similarly, Tim emphasised the need for a cross-curricular mandate, noting that "it is not hanging on any particular curriculum [area] but it can be wonderfully addressed from all sorts of perspectives." He gave an example of a student's work that conceptualised this idea, explaining:

> He made this wonderful diorama. He created a situation with lots of classrooms, a wooden model, in the middle of the model was a model of earth with oceans and things like this and surrounding this was different classrooms and each classroom had a label, mathematics, etcetera, and each classroom had a big window into the middle. He conceptualised this model, this is a fantastic example, an incredible picture.

The idea that an integrated curriculum would ideally, not only teach climate change education, but also provide an infrastructure that role modelled sustainable living was suggested by Nathan, who stated "the buildings would have to be sustainable and leave a very modest carbon footprint in regards to building and maintenance." Of interest here was the enthusiasm and

consistent belief by both cohorts of participants, of the advantages a cross-curricular climate change education pedagogy might have in students' learning. It is often argued that the climate crisis is a result of dislocation from environmental systems. By incorporating an integrated and holistic approach to climate change education, via cross-curricular pedagogies, there are opportunities to align and replicate the integrated and holistic systems so important for planetary health.

Both cohorts expressed a belief that cross-curricular pedagogy would suit climate change education. Within such an approach, there was support for climate change education to also use project and inquiry-based learning pedagogies - such as action competence.

5.6.4 **Action competence**

Action competence is supported by the Ministry of Education (2007a), who asserted that action competence offers an educational goal that is problem-orientated, holistic, and uses cross-curricular strategies to support individual and collective action, particularly when structured around a project. While no participants used the term 'action competence' (not even teachers), both strike leaders and teachers made pedagogical suggestions for climate change education that could be interpreted as action competence. For example, Lilly stated:

> It is a really good learning experience for children and teams to be involved in action. They want to make a change and want to be on the right side of history. Schools need to make room for that, not just teach about sustainability but teach about climate change and action and what people can do.

Action competence can enable self-direction and management, and Lajos considered this approach to be an effective learning strategy, saying that "the importance of students having power and autonomy over themselves and their learning is actually what creates the best environment for them to achieve as high as possible." These comments imply a view that students engage more when they have greater control over the contextual nature of their learning, and recognise the relevance it has to their lives. The contextual nature may include real-life problem solving or project-based scenarios.

Problem orientated and project-based learning was indicated by four of the teachers interviewed as examples of current school practice. Kathy recalled, "I have a year 13 student who has designed an atmospheric water generator and it cleans the water so it can be used as drinking water and also used in the context of a clothes dryer." Susan, who utilised context-

based teaching for climate change education, anticipated this approach would become a more prevalent pedagogy in the foreseeable future, noting that "they are bringing in the NCEA [assessment system] changes. From what I have heard there may be a real revolution in context [based] teaching and I hear there is going to be another batch of resources around climate change education available. So, it feels like early days."

Tim proposed that, in an ideal world, climate change education is best approached:

> …in an evolutionary way where people try things out, many things are tried out, then we share, what did you do? 'Ahh this was successful, this wasn't'. I think it can't be centrally managed so much as it should be [at the] grass roots.

Stella suggested inquiry and project driven cross-curricular learning, explaining, "we could do specific projects like cleaning up water-ways. What could we invent, how could we do this, what's the maths learning in there, who would we write to for literacy? " Lizzie teaches at a provincial school that has many rural and Māori students. She enthusiastically suggested a locally based, action competence programme. She stated:

> I think that amazing concept of genuinely being a facilitator, teachers getting topics of interest and their feelings and dynamics out of student bodies and giving them that space to talk and share to find topics and collaborate and literally create that forum and space where they can redesign and recreate a future.
>
> It needs to spread out from the school into the town… here the way we would flavour it, we would have a marine academy. It would be environmental but very focused on the marine environment. Creating seaweed farms and learning about kina barrens. Talk about how to make a school relevant for its students…

Self-directed learning, however, requires teacher support. Kathy noted, "In any subject, you can focus on these issues but you [teachers] have to have the background knowledge or interest in order to make it work." Correspondingly, Tim argued:

> I think it is important for teachers to get away from the mindset 'oh, here is a good resource, or here is a PowerPoint we can run

> on climate change, and we can talk about this blah blah blah'. That's all fine and good but that's not where it's at. It has to be at a truly, deeply understanding depth and concern of the issue.

Individualised learning is an area that educators are still grappling with. According to Nathan, "I think as schools and as teachers, we still struggle with student voice, student autonomy, student agency. I still think we are too much led by the curriculum, we don't teach people, we teach subjects," he said. These findings suggest teachers are prepared to embrace, even excited, about problem-orientated, project-based pedagogies that lead to the development of action competence. However, barriers to action competence approaches may include the lack of teacher's content knowledge and reliance on traditional teaching strategies.

The strike leaders' comments implied that schools might be 'out of touch' with youth needs, and bemoaned the current pedagogical and secondary school structures. Marama stated,

> I think their idea of education is so outdated and it needs a revamp, to be honest. There are so many kids that sit in class every day and they are so unhappy with how the world is and unhappy about how their lives are. Making sure changes go into a place where kids can actually learn in a way that suits them is really important, and [to] learn the content that matters to them.

Catherine also called for pedagogical changes in education. Further to a cross-curricular and action competence approach, she suggested 'socioemotional' pedagogies for climate change education - to ensure learning engaged 'the head, the hands, and the heart'.

5.6.5 **Engaging the head, the heart, and the hands.**

To motivate and engage youth in the classroom, it was suggested that climate change education must be three-pronged and should offer balance between academic, practical, and emotional pedagogies. For example, Jake argued that academic credibility should sit alongside the practical application of sustainability education. He stated:

> It should be practical and really academic, there should be a balance of the two. I know that the sustainable class that is currently at my school is not very academic, it's quite practical. They do some planting but the lack of academic level loses it for a lot of people. They think, 'why do I take subjects? Oh, it's

> because the university will consider that', it's prestigious in a sense like people take calculus just to put on their C.V. So, I think that the delivery of it should have a really core academic level and we need to make sure that is stressed for the senior years with climate change, and it isn't just naively painted in at a younger year, because then it will never get the official crediting, which it actually needs.

Catherine similarly contended that strategies should aim to increase students' critical thinking:

> What I found really useful is giving people something to critique. Rather than teaching [about] a Bill that is being passed or we want to put in Government… Teachers should be asking, 'what is wrong with it? Who does it miss? What is good, how is it bad? Because that engages people's critical thinking, which I don't think happens enough at school.

The second important component was the utilisation of practical experiences to engage the hands. According to Josh, this would contribute to meaningful and localised learning. He stated:

> Schools getting involved with, for example, riparian planting as well as trapping, because those are both things that not only get people involved in environmentalism but also in conservation. It makes them think more about the environment and how environmental degradation can affect them, so the more that students are going out to do, the more they will gain an understanding of the issues.

Similarly, Jake asserted, "it's integral that students have to do some sort of project-based learning, a bit like business because essentially it'll come down to the actions that people do that need to be stressed."

The value of nature-based, practical activities was expressed by drama teacher Lizzie. She argued that practical experiences offer valuable connections, enabling the physical activity to prompt emotional experiences for students, stating:

> The more they are getting to know nature and getting to love a patch of earth - the more they are willing to look after it. You know lots of young people here have done that with replanting sand dunes. What an amazing thing that was to witness.

Lizzie implied that offering youth practical, 'hands-on' experiences in nature encouraged connection - to activate the heart.

The final component, engaging the heart, was considered by the strike leaders as the most likely way to motivate students to take action. It was the 'heart-connection' that Catherine considered was lacking in current sustainability education and climate change education offered in schools. She stated "climate change is an issue you need to teach people how to engage emotionally. No point just teaching what climate change is, I know my school does that but people don't take notice." Catherine suggested this was one of the reasons why the climate strikes successfully engaged so many because they connected emotionally, noting that "they talked about equality, racial justice and I suppose that builds the empathy and the compassion along with the knowledge around climate change." Likewise, Madison stressed the motivating power of empathy, indicating that:

> The ecosystems just seem a world apart from us. But saying 'these are countries that are going to be drowned from climate change, look at this, this is what is going to be happening', it just motivates people from a more holistic perspective, it doesn't just affect ecosystems, it affects us and will change the world as we know it.

Motivating action and behavioural change were considered more likely with the utilisation of the 'head, hands and heart'. It was considered important to offer holistic pedagogical practices that balance academic, practical, emotional understanding, and skills.

The 'how' of climate change education was believed to require a mandate that ensured leadership-driven support and practice. Utilising pedagogies that promoted inquiry and encouraged action were suggested by both teachers and students, this implied an action competence strategy that is already endorsed by the *New Zealand Curriculum.* Further importance was placed on pedagogies that engaged the 'head, heart and hands', as they were considered highly motivating particularly when the academic component offered credibility for tertiary education. Now I turn to the ideas presented for the content of climate change education.

5.7 Climate change education content

When considering the "ideal" educational content for climate change education, participants' suggestions encompassed the need for secondary students to understand the science behind climate change, social justice, indigenous knowledge, and political agency.

5.7.1 Understanding the science behind climate change

Understanding the science behind climate change was considered pivotal for strike leaders on their journey towards action. As reported previously in the emotional journey (see Section 4.3.4), increasing climate change awareness was often considered the first step towards engagement. It was suggested that youth who are disengaged are likely to lack an understanding of climate change and are not aware how a lack of action will impact their future. Alternatively, the findings imply they might choose to ignore the narrative, as it is too distressing. Tina's comment was typical of others', stating "the thing is if more kids learned about climate change, more kids would be empowered to take action. It is all about, if people don't know that it is a problem, they won't take action."

Oliana volunteered her time to work with students at a local primary school. She explained what her experiences taught her:

> There is so much to cover with climate change… I think most people understand some parts of the world are getting hotter and some parts are getting colder, but they don't really see the reasoning behind that. They don't understand the carbon cycle or the water cycle and how it all comes together. So, I think it is important to start with the basics.

Five strike leaders indicated receiving some form of science-based climate change education at secondary school. For example, Huia recalled, "I was in an extension science class so only 30 people were taught about carbon chemistry." The rest of her year level received no sustainability education or climate change education. While the science was considered a crucial component for understanding the problem, Madison felt understanding the science alone was insufficient, saying "I think schools do teach the baseline understanding like oxygen, water, what we need for our ecosystems but they don't teach about the deeper understandings, like, 'hey, we might be fine but look at all these people who won't be fine'." Most strike leaders suggested that science is a necessary precursor to understanding climate change, but asserted that this alone, *it is not enough*.

Drama teacher, Lizzie held a similar perspective, indicating that "they get taught from this very limited perspective and they don't get taught in terms of social evolutionary journey and planetary - it is all part of a process." To engage students, strike leaders emphasised the importance of linking the science to consequences that have led to social injustices, thus facilitating an understanding of the need for equitable and effective climate action.

5.7.2 **Social Justice**

Recognising social justice was described by Huia as understanding, "climate justice, social, economic, political implications of the climate crisis, and the demand for intergenerational equity." It was suggested that youth may resist learning about ecological collapse as it increases anxiety, but that conversely, understanding intergenerational and social justice issues might also be a greater motivator. Huia stated, "people just can't engage with the idea that the world will fall apart and that we are in the midst of an ecological breakdown. I really think the social implications are a large driver for action." Madison presented a similar view, stating that:

> Social justice is really what motivates people to get up and do something, because ecosystems just seem a world apart from us. But saying these are people that are going to be drowned from climate change, look at this, this is what is going to be happening, it just motivates people. It is a more holistic perspective, it doesn't just affect ecosystems, it affects us and will change the world as we know it.

Interestingly, these comments reflect an anthropocentric view of climate change and prioritise the importance of human beings. The strike leaders' comments suggest their concept of social justice does not extend to the rights of other species, an understanding of the importance of biodiversity, or the vital interconnections humans have with their ecosystems.

Embedded, however, within the social justice paradigm was the endeavour to ensure *just* transitioning practices. This includes indigenous cultures and those most affected by climate change. According to Madison, education must promote an understanding about "aspects of deeper social justice like colonialism and destroying indigenous understanding," if ethical and just climate action is to occur. Just transitioning also includes consideration of those in economically advantaged countries who will be negatively impacted by the transitioning processes. Lilly explained:

> It is so important having a just transition because we need to support people whose livelihoods rely on that [high carbon emission industries], and it's really hard if your job is something you love and it is being taken away from you. We have to find a way to make it work.

Similarly, Oliana discussed the conundrum with agriculture emissions that are derived from Aotearoa New Zealand's largest tradable commodity As she stated:

> Our biggest emitters are agriculture. I would like to not only have research put into it but a lot of assistance for our farmers. They will inevitably have to move away from intensive farming to more sustainable farming so they need support from the government [for this to happen]. New Zealand is run on dairy so hopefully, we can support them through it, it is their whole life to them and I would like to see New Zealand prioritise those people and not villainise them.

Four out of eight teachers indicated the importance of social justice issues. Nathan suggested those from his school who participated in the strikes were "social justice warriors," and he was concerned about "the equities around what is happening because of climate change and the equities around the voices of the young people who are going to inherit this mess and who are not being heard." Economically disadvantaged communities were a consideration for Tim and Lizzie, because both worked at schools that drew students from indigenous and lower social-economic communities. They suggested that in these communities there were different priorities that led to minimal or negative engagement in climate action. The social justice concerns associated with Aotearoa New Zealand's founding document was a major consideration. For example, according to Stella, a priority "in Aotearoa is the Treaty of Waitangi and keeping that in the forefront of our minds." This remark echoed other participants' comments - that a significant aspect of social justice is the need to listen and learn from indigenous voices.

5.7.3 **Indigenous knowledge**

Respecting and understanding indigenous knowledge was mentioned by five students and four teachers, indicating its importance for equitable and sustained climate action. At the opening rally in Auckland, Pania Newton, protest leader from Ihumātao land protest, said "a fight for climate justice is a fight for indigenous rights" (Franks, 2019). Mia Sutherland suggested in a

Stuff opinion piece that the strikes offered a "practical history lesson… just like our ancestors, we are protesting injustice" *(Sutherland, 2019).* The perceived 'Westernisation' of climate action was commented on by Madison, who stated:

> The environmental movement became very Western. I am speaking from experience, I lost perspective of the core of the movement which is environmental justice, which means we were not just for people to stop destroying the earth, we were advocating for minorities who would be affected the most. We were advocating because indigenous people had lost their voice and theirs was the voice we really needed to listen to.

Addressing the system that has disenfranchised indigenous rights was also of concern for Jake. He stated "indigenous sovereignty, groups that have been oppressed for so long. It is really more a systematic and societal thing that needs action." For this to happen an understanding of Te Ao Māori [Māori world view], which considers the interconnectedness of all living and non-living things, while not explicitly stated, was implied. For example, Oliana commented, "the environment is a social problem in that they are very heavily connected and you can't solve one without solving the other." Madison also suggested we need to listen to:

> Indigenous perspectives, we should have a stronger relationship to the perspective of whakapapa [a fundamental concept in Māori placing individuals in a larger context that considers their land and genealogy] and kaitiakitanga [protection and guardianship over the land]. The people who are not Māori and Pasifika [should] take a step back and allow those voices to be the predominant ones in this crisis.

This idea was carried through in June 2021 when the Auckland chapter of New Zealand school's strike for climate disbanded, *The Guardian* reported a spokesperson stating "people of colour were disproportionately affected by climate change, so the fight for climate justice should be led by their voices and needs, not Pākehā ones" (McKenzie, 2021). This move was not supported by all. Sophie Handford, the national coordinator of the 2019 climate strikes agreed that it is important to have indigenous led kaupapa (policy) but added concern that such a move may "send a message of division and that not everyone is needed".

There has been no publicity around any replacement of the Auckland Strike 4 Climate movement with an indigenous-youth climate strike organisation. This does not mean that indigenous groups are not taking climate action, only that the format used for the climate strikes may have been more representative of pākehā (European) processes - as seen by the demographics who attended the 2019 climate strikes.

Since the disbanding of the Auckland chapter, and the COVID-19 lockdowns, the presence of youth-led climate strikes in Aotearoa New Zealand has declined. The Fridays for Future movement has continued to provide an online presence for climate action with youth representation, however, it is not always perceived to be youth-led. For example, Aroha stated, "it is important to note that school strikes are different to Fridays for the Future. In New Zealand, Fridays for Future is mainly run by adults, and they are more inspired by Greta, whereas School Strikes 4 Climate is run by youth for youth". The Fridays for Future Tāmaki Makaurau (Auckland) group were part of a global protest that encouraged Auckland students to strike for climate on 23rd September 2022. *Radio New Zealand* reported that thousands of students attended nationally (Radio New Zealand, 2022). The stated goal reported in the media was to focus on Māori and Pasifika voices and build relationships with existing groups working in the climate action area (Williams, 2022). Despite, or perhaps because of, the public criticism regarding barriers to people of colour attending the 2019 climate strikes, 12 of the strike leaders indicated the importance of increasing our acceptance and understanding of indigenous knowledge and indigenous rights.

The strike leaders argued that a social justice paradigm would incorporate indigenous knowledge into climate change education, and that indigenous knowledge and indigenous rights was a valuable tool for climate action, as a more equitable and potentially enduring way forward.

Half of the teachers interviewed also commented on the importance of indigenous rights. Social studies teacher, Stella stated:

> Indigenous perspectives are a huge thing. I read a statistic that about 5% of the world population is indigenous, 80% of the world's biodiversity is protected by indigenous people. So that is the way forward, to listen to our indigenous perspectives in each place.

Deputy Principal Kowhai, suggested, “as educators, we should use it as a platform for our lessons. I know for me, as Māori, we do that. We always bring it back to our ancestors and how they did things, and kaitiakitanga [guardianship].” For such necessary connections and to promote kaitiakitanga, experiential, hands-on learning was suggested. Drama teacher Lizzie, suggested to “let our students have a creative experience with nature and bond with it to create this new generation of kaitiaki [guardians].”

The strike leaders' and teachers' comments could be summed up by Social Studies, Head of Department, Stella, when she advocated we “listen to the wisdom that is there already.” Understanding social justice was positioned as an essential component of climate change education and this knowledge was considered to underpin the motivation for increased political literacy and agency among youth.

5.7.4 **Political agency**

Heightened political awareness and agency was an unexpected outcome for many of the strike leaders interviewed. Minister of Education Chris Hipkins suggested students could learn a lot through civic activity such as the climate strikes (Walls, 2019) and this was the case for many strike leaders. For example, Madison said, “the strikes got me involved in this whole political scene, I didn’t expect that to happen.” For Jake, it had the potential to be overwhelming, as he noted that “sometimes the system feels too big that I feel like I want to remove myself from it”, but Jake found he enjoyed the political involvement and the subsequent learning his strike leader role involved. Sophie Handford insisted the strike movement provided a democratic process, asserting that, “decisions would come from the group up, not the top-down” (MacManus, 2021).

Most strike leaders argued that their personal experiences indicated schools needed to place more value on empowering youth political voice and agency. Huia stated, “they [students] don’t have the education to know how or why we need to bring about change politically.” Catherine asserted a need for deeper thinking around the issues, to lead to understanding of the historical connections between politics, the economy, and the environment. She stated, “I used to see things as black and white, like this is good, this is not so good but what I have learned is actually there is a whole spectrum in between.” The strike leaders appeared to increase not only their awareness and understanding of political systems but also their critical thinking.

The need for systemic change was often cited, and from Madison’s perspective, “to be a change maker is to be political.” Huia argued that “we need to shift our entire political models and the ways we do things, a systematic shift - but that’s really hard to educate people on.”

Understanding the need for systemic change was more powerful and far-reaching than focusing on individual behaviours, argued Josh, who stated, "I think individual change should be more towards influencing government change because that is where the actual power is." Lajos explained why he believed the power lies in politics, stating:

> Telling people to buy a keep cup, or change their shower head, things like that is cool, but actually for people in poverty, and a lot of people in this country are, through no fault of their own, they are not going to be able to make individual lifestyle changes because so many are out of their control.
>
> You can't exactly tell kids who don't feel safe in their community to bus or bike. You can't tell farming kids to go home and tell their dad not to farm…. [But] we can do it with legislative changes. I think this is the only way we are going to have huge individual action is if the government incentivises or enforces it.

These comments show a critical understanding of the political directives needed to help mitigate not only the environmental challenges but also the social and economic challenges the climate crisis presents. Examples of changing behaviour and effective, government-led initiatives were given by Jake, who explained that "the public has been really good at just doing what they're told, like with COVID 19, they just sort of accept it. It's also a bit like removing plastic bags, no one remembers plastic bags now." Likewise, Lajos commented on the educational reach of government powers, stating that:

> …[through] COVID, we have set a precedent that when there is a crisis, we can have it showing up in between shows, [and] on YouTube ads. The reach of the government when they need to get a message out to the people is actually as big as they want it to be.

Politicians' motivation, however, was questioned by Jake who expressed scepticism at the support given to the climate strikes from some. He said, "the climate strikes at the moment have just encouraged the government as another avenue to get a voter base, rather than actual action." More students, however, emphasised the belief that politicians would be swayed by the aspirations of their constituents. When talking about the Zero Carbon Amendment Bill, Mary suggested that, "knowing that if they didn't vote for this they were going to lose a large part of their voter base, knowing that the heat was around climate change… I would love to

see more educated voters." This view supported Oliana's observation that "learning as a generation we do have a lot of power… and [we can] get the attention from people in parliament." During Oliana's strike experience, she discovered, "to be political means to care," and she would like to see schools:

> Teach people what it means to be in a democratic society because a lot of people don't understand the weight of a vote. I think that once youth get more engaged we can push for a lot more change and show the government that we are involved and we want to be involved.

Based on the strike leaders' perceptions that political literacy with youth is fundamental for climate action, I asked the teachers how well they felt the current educational system prepared students for their civic/political responsibilities as adults. Lizzie suggested "they don't! It should be a whole area in itself; they are appalling at it." Most, however, identified it as part of the social studies curriculum but argued for greater inclusion. Nathan felt the teaching of politics was "not [done] well enough… What upsets me is that 16 and 17-year-olds are always politically disengaged. I think it is important to politicise students, not from my viewpoint, but with the idea of being engaged with the world of politics." The climate strikes, however, did engage youth and, according to the strike leaders, encouraged them to become more aware of their political impact.

The strike leaders, while lamenting the lack of youth political voice, did suggest the climate strikes provided an opportunity for the youth voice to be heard. The Zero Carbon Amendment Act achieved a bipartisan agreement in November 2019 (Cooke, 2019). This act targeted the reduction of greenhouse gas emissions (except biogenic methane) to zero by 2050. The climate strikes promoted youth action on this Bill. For example, in Catherine's area, "we taught people how to write submissions." This action proved very successful, suggested Marama, who stated:

> I know so many people in my school that would never have made a submission on the Zero Carbon Bill, but they did, and apparently, they had never received so many submissions for any Bill ever…when [Climate Change Minister] James Shaw released the Zero Carbon Bill he said it was in response to students walking in the street and that was a really important moment for us.

The affirmation youth received from James Shaw's comments prompted strike leaders to feel proud that youth had contributed politically to a significant Bill. Arguably, the perceived success of youth voice in this context may encourage those who participated to have greater political interest and participation in the future.

It is unlikely the school environment is able to replicate an activist environment such as the climate strikes to engage and inspire students to learn in the way the climate strikes did. However, many strike leaders felt schools need to change the way things are done. All participants expressed concern for the lack of climate change education in the current teaching and learning programmes. For a climate change curriculum to engage students toward action, the participants recommended it should include the science behind climate change, social justice, indigenous knowledge, and political literacy that leads to agency. Of interest was the unanimous support for a mandated climate change education programme in secondary schools. The following section discusses the barriers individual teachers and educational institutions currently face.

5.8 Barriers to climate change education

Barriers to climate change education in secondary schools have been well researched and documented, and the findings presented here show many barriers to climate change education remain in Aotearoa New Zealand. When teacher Ava was asked what she would say to climate strike activists, she replied, " I am sorry it has taken this long for education to start waking up and I am sorry there are still so many barriers to it within school." Kowhai suggested that, "the barriers are time, money, teachers' confidence in teaching it, because not all teachers are up with the play and they are focused on their own little world. I think we need to educate our teachers before we educate our students." The findings here support previous research, identifying the difficulties that secondary school educational institutions face with climate change education, and include: teachers' lack of knowledge, curriculum pressures, lack of professional learning and development, and resources.

5.8.1 Teacher lack of confidence and eco-anxiety

The complexities of climate change education and rising eco-anxiety among youth continue to deter teachers from incorporating climate change education into their classroom planning. Nathan suggested, "there is a profound sense of anxiety around the issues… I think climate change is the most pressing thing we face as a globe and that's a really hard conversation to have." Likewise, Susan reflected on how climate anxiety may impact her classroom planning:

> I have had a number of my junior students suffering from anxiety over the past couple of years. So I guess something like this they would take on board as well, it does influence my decisions on what to cover… There are good messages but I don't want to be the one responsible for them turning into vegetarians, it is quite a weight to carry.

Teachers reported feeling ill-equipped to manage rising levels of anxiety when addressing the challenges associated with climate change and this was considered a significant barrier, alongside curriculum pressures, for climate change education in secondary schools.

5.8.2 **Curriculum pressures**

Many teachers indicated the pressures of their current curriculum requirements overloaded their teaching time, allowing no capacity for anything else. Unless very motivated, the time-poor environment meant teachers were reluctant to do the preparation needed for introducing new content. Ava suggested this pressure was felt by both individuals and departments, stating:

> I think every department and every teacher is under so much pressure to teach this, and this and this and meet all the objectives we need to meet, and there never seems to be enough time to do all these other things that seem so important. So every teacher feels like that and every department feels like that and there's the gap.

The gap Ava implies is between teachers increasingly recognising the need for some form of sustainability education or climate change education, and the ability to be able to teach it. In the senior secondary school, Tim suggested that the NZQA framework also impacted on expectations, stating:

> You come into the NCEA [senior secondary assessment qualifications] age where the beautiful curriculum that we have is on the top shelf somewhere in the teacher's bookshelf and the NZQA standards are in the front of the teacher, and what matters really is what NZQA tells you to do. The students want to have credits, and lots of them, and they don't want to be distracted. So the biggest impediment to climate change education in New Zealand high schools, where it belongs I think, where the mental

> development is far enough to actually deal with the issue properly, the biggest impediment is NZQA and the NCEA structure.

Five teacher participants considered assessment priorities impacted on meaningful learning. For example, Nathan said, "beyond the production line of education, I think the big picture stuff that we talk about isn't being done in enough schools because we are being driven by assessment – it does come back to that." While many students and teachers indicated the complexities of climate change education lent itself to senior school, Ava and Kathy suggested it may be better suited at a junior level. Kathy stated, "I would like to put it at junior [school level]. With social studies and business studies you can do a social action so there is a lot of room for movement." This suggestion applied to climate change education being incorporated into the current siloed nature of secondary schools. Susan, however, indicated that in her school, "they had no interest teaching climate change education in the siloed classes." She was referring to previous conversations she had with colleagues:

> It is that, 'oh we are so busy, we teach so much already' or 'oh my goodness this is just another thing that I have to learn about'. So it is not so much they don't want to teach climate change because of their philosophy it is more, 'oh it is another thing' because they have so much on their plate already.

For this thinking to change, it was suggested more resources in terms of professional learning and development, time, and financial support were needed.

5.8.3 **Resources**

For schools to initiate sustainability education or climate change education "by themselves is really difficult… money is a really big factor," according to Kathy. She explained how the teachers who currently offer extra-curricular sustainability education have to juggle priorities because, "you don't get paid for it and its a lot of work as well so I have to try and balance that out and not let it overtake my teaching." Kathy suggested initiatives such as the Sustainability Contestable Fund were promising, because "it will enable them to do so much. It makes it really worthwhile for them to make that effort. So if it is government-driven, it is fantastic." The financial incentive offered with the Sustainability Contestable Fund (Ministry of Education, 2021e) aimed to support schools to improve their operational efficiency while reducing their environmental impact. The funding applications closed on 31st January 2020 and saw 365 applications, of which, 53 were successful. While financial incentives for school

infrastructure were considered worthwhile, resources to increase capacity and climate change knowledge within the educational fraternity were also considered necessary.

It was suggested that professional development (PD) to upskill teachers with climate change knowledge and pedagogies would address barriers. For example, Stella said, "some PD where teachers can plan a unit, maybe we stop thinking in silos and start working cross-curricular - that would be beneficial." Nathan disclosed that in regards to climate change education, he felt unqualified. He suggested most teachers needed up-skilling and support for integrating climate change education into their teaching programmes, stating:

> I would like to do a really good residential course for a week where we look at the intersection of… the New Zealand curriculum with a far-reaching in-depth look at policy or thought document around what a sustainability curriculum could look like. How could I realign? I still want to teach certain aspects of drama and theatre but how can I realign what we do and how we do it with a document like that? That would be really interesting.

The barriers of time, NCEA priorities, professional development, and resources were considered insurmountable in some schools. This was attributed to their school culture.

5.8.4 **School culture**

The school environment and culture were considered a barrier for six of the teachers interviewed. For example, Lizzie believed that teaching sustainability education inside the classroom impeded impact, suggesting "it is so hard to learn about nature in a sterile cubical classroom with a Scipad or textbooks and fill out the blank spaces. How can you bond with nature?" Nathan also considered, "it comes back to the physical structures of the buildings that we teach in," and suggested that the physical surrounding of the school should reflect sustainable practices.

Cultural generational differences were suggested by Susan, who experienced climate deniers in her science department. She said, "one would expect a person well versed in science to be aware, but at the same time we are talking about an older, traditional generation." The cultural barrier presented by conservative generations was a challenge, according to Tim, who stated:

> It may be dependent on the community. We live in a very conservative community, [with] reasonably wealthy families who enjoy being there and don't think much about climate change. They haven't got to the point of taking the concept seriously yet so it's not an issue that is debated in families. One scathing letter implied child abuse [by] talking about climate change and disturbing their ideas about the future, and not telling them they are living the best time history has ever had.

Nathan considered one of the greatest barriers was schools' general lack of agility, because "schools are an oil tanker, they take about 8km to turn." He used the analogy of the London underground to explain why schools will struggle to make the changes necessary to incorporate cross-curricular climate change education, stating:

> I keep thinking about the Japanese train system after WWII, they didn't really have trains, they started their train system from scratch, there was nothing there. And then growing up in London, I remember how the train systems were so awful and that's because trains had evolved over 250 years, amazingly. And now because of that interconnectedness, that strange lots of different motivations, different competing groups, you could never have a single idea like the Japanese had. I think we have a similar problem in education.

Kathy's comments also supported Nathan's suggestion that it is difficult to rapidly create change within a school's culture, saying "what I am trying to do is bring in different things, like one big focus each year that focuses on changing culture." This comment epitomises the difficulties many teachers experience when trying to incorporate sustainable practices or climate change education into their classrooms and school culture.

5.9 Chapter summary

The findings suggest ongoing barriers in secondary schools to climate change education and that both strike leaders and teachers felt varying levels of dissatisfaction with current secondary school systems. These sentiments support critical theoretical assertions that education increasingly lacks relevance for students (Irwin, 2020; Kwauk, 2020; Verlie & Flynn, 2022).

Presently, students' primary source of climate change information was most likely to come from social media and that was deemed inadequate for the complex and potentially anxiety-inducing issues around climate change. All participants believed that secondary schools must incorporate climate change education to adequately address youth needs. However, teachers felt unprepared and too overworked to attempt a new and potentially controversial topic.

The existing curriculum was considered to provide enough flexibility to incorporate climate change education, but leadership support was considered critical for wide-spread and successful integration of climate change education. Teachers and strike leaders suggested addressing existing barriers would require governmental and leadership support to drive the implementation of climate change education. However, there was also the perception that pressure from students might become the impetus for schools to incorporate climate change education. These findings signalled that teachers and students recognise the urgent need for climate change education and that teachers were willing, with support, to take on the challenge.

The knowledge and skills students gained during the climate strikes aligned comfortably with the key competencies from the New Zealand Curriculum (Ministry of Education, 2007a). Strike leaders who had experienced climate change education at school found it to be primarily science based. Understanding the science behind climate change was identified as an essential component of climate change educational content, but enhanced engagement necessitated further understanding of social justice, the value of indigenous knowledge, and increased political literacy - that led to political agency. Holistic and critical pedagogies that balance academic expectations and activate the mind (head), the emotions (heart), and contain a practical component (hands) were also considered more likely to engage a wider range of students.

The 2019 climate strikes provided a platform for youth voice. Their voices condemned adult apathy and climate inaction. Inadvertently, the voices also critiqued what they perceived to be an outdated Aotearoa New Zealand education system. The findings presented in this chapter reported strike leaders' and teacher perceptions, with the aim of informing educators on the motivators for the high levels of striking youth and how secondary schools might enhance climate change education. The following chapter interprets these findings, with consideration of the literature review and within the context of my research questions, to discuss the implications of this research.

Chapter Six: Discussion

6.1 Introduction

This chapter provides a synthesis of the findings and the literature review as a response to the guiding research questions.

i) Why now? What has motivated and engaged students to take climate strike action?
ii) How does participation in the climate strikes influence understanding of climate change and motivate action?
iii) What are student and teacher perceptions of educational outcomes for youth who participated in the climate strikes?
iv) What are the implications for future climate change educational practice?

Youth voice was explored through in-depth interviews with strike leaders and classroom teachers (some of whom were also on the school leadership team) – all participants were studying or teaching in Aotearoa New Zealand secondary schools during the 2019 climate strikes. The aim of this research was to explore how to better support educators around youth engagement and pedagogical practice with climate change education.

My findings support theoretical arguments posited by Freire (2015) that considers reflection of the status quo may lead to an understanding of a power imbalance and therefore is likely to prompt concrete action that can be transformative. The climate strikes represented an uprising of youth, who are oppressed by the past generations' neoliberal focus on consumption and oppressed by a lack of transformative education. Rather than adults safeguarding future wellbeing for youth, the accepted behaviours of previous generations have burdened youth with a frightening, unstable, climate altered future. The strike leaders argued that through participation in the climate strikes their experiences led to a realisation that climate instability necessitates education shifts its focus to more authentic and meaningful learning which involves climate action. These findings support Orr (1992), Irwin (2020), and Verlie's (2022) assertions that education can no longer prioritise cultural reproduction and instead consider how it can best support cultural transformation.

An underlying theme to emerge from strike leaders and teachers was the high levels of anxiety youth are experiencing regarding their uncertain future, but that it was the *emotional* engagement that became the catalyst for raising their understanding of climate change and heightening political agency. Strike leaders and teachers considered formal education as critical to support youth through this turbulent journey and in the process bring about the societal

changes needed for a more climate secure future (Gough, 2015). The strike leaders called for the education system to cut through the barriers currently facing secondary schools with government-led mandates that support the rapid and consistent delivery of climate change education. However, in the absence of governmental mandates, strike leaders and teachers suggested school leaders still have the agency to enact change. Ultimately, strike leaders, teachers, and educational researchers have argued that secondary schools must consciously shift away from a system of cultural reproduction to becoming enablers of cultural transformation.

This research is based on an interpretive paradigm using a critical theory approach and thematic analysis. The following discussion is framed around the four guiding research questions and is focused on educationally relevant and prominent themes. Subsequently, the implications of this research for teachers and the education sector are outlined.

6.2 What has motivated and engaged students to take climate strike action?

My findings identified six motivating and interlinked factors that strike leaders and teachers suggested were most likely to engage students and encourage participation in the climate strikes. The order of priority was determined by how frequently they were mentioned, they included; heightened climate awareness; a youth-led movement with role models or involvement of friends; anxiety; the global nature of the movement; making a stand, and curiosity.

Many argued that youth engagement in the climate strikes stemmed from the youth-led nature of the movement, friends, and the global social media presence around the climate strikes. The media whirlpool and global nature of the strikes heightened awareness of the climate crisis and individual's democratic right to protest. Students became curious prompting them to make a stand and attend the strikes. The strike leaders reported their growing awareness of the seriousness of the climate crisis which heightened their anxiety, and when combined with an understanding of historical social injustices and political inaction, drove them to become protest leaders.

Climate action was considered twofold, one that incorporated individual actions, but more importantly, action that pressured political mandates with a view to support a shift in systemic societal models. Climate change education in secondary schools was considered essential to enhance awareness and address the growing levels of youth anxiety, by improving an understanding of the need to take action and prepare for a climate altered future.

This research focused on the voices of strike leaders who were motivated to take climate action because of their heightened awareness, increased anxiety and the youth-led nature of the movement. These themes are discussed next.

6.2.1 **Raising awareness of climate change**

A key motivator for strike leaders was the aim to heighten awareness of climate change that encourages climate action, a role they considered should fall under the mandate of a future-focused secondary school system.

Exasperation at both educational and political climate inertia was compounded by adults' apparent lack of awareness around the high levels of climate anxiety among youth. Media reports endorsed this perception and while many adults supported the climate strikes, some key political and educational leaders dismissed the raised voices of striking youth, prioritising time *in* the classroom ahead of youths' concern for their uncertain future. On a global and national scale climate change "blinkers" have thwarted meaningful political action which has translated into an education system that is also reluctant to address the complex issues surrounding climate change. This has led to poor resourcing and minimal capacity within secondary schools to address youths' climate concerns, or to confront the challenges involved with climate change education (Everth & Bright, 2022; Verlie & Flynn, 2022).

A lack of climate change education was suggested as one of the root causes for climate inaction. There is no motivation to take climate action if you are unaware of the climate issues – a lack of awareness is why many chose *not* to attend the strikes, according to strike leaders. Heightened media coverage, particularly social media, raised awareness but was not always considered accurate or reliable. For 12 of the 15 strike leaders, learning about climate change originated outside formal education. They were generally reluctant to rely on social media for their knowledge so conducted their own research into climate change. Concern over misinformation disseminated via social media prompted some strike leaders to themselves become educators among their peers. Climate action and a lack of formal climate change education has left students feeling betrayed by adults (Jones & Davison, 2021; Kowalski, 2019).

Educators who have tried to raise climate awareness often do so in a vacuum of support (Bolstad, 2020a; Kwauk, 2020). The teacher participants interviewed for this research, even those who were not involved in environmental or climate change education prior to the interview, unequivocally expressed sorrow around both political and educational inertia towards climate education. Some suggested the tide is turning – that there was a growing

awareness among teachers that political and educational climate apathy now represents a travesty of justice for youth.

It is understandable that climate aware youth may feel adult apathy acutely and resent that the responsibility to deal with a climate altered future appears to have been shirked by adults, whose role is to safeguard youth (Berman, 2021; Bright & Eames, 2021; Cianconi et al., 2020; Hickman et al., 2021; Pihkala, 2020). With minimal guidance or support the strike leaders taught themselves about climate change which often left them feeling overwhelmed and anxious (Ojala, 2021). Taking youth voice seriously requires empowering youth voice and reimagining how education may enhance future generations security in an environmentally fractured world.

My findings concur with those of Verlie and Flynn (2022) who argue the school strikes posed "a reckoning for education" (p5) by highlighting an existential crisis within traditional Western education systems. To remain relevant, education must recognise its role in the transformation process needed to address the impacts of climate change (Everth et al., 2021). Students were motivated to strike in 2019 because the global media around the climate strikes heightened their awareness of climate change and biodiversity loss which often led to anxiety over political and educational climate apathy. Secondary schools have the potential to become genuinely future-focused agents of change (Kwauk, 2020). Prioritising climate change education in a secondary school context will further raise student awareness and community awareness which, if facilitated appropriately, will potentially reduce the high levels of eco-anxiety.

6.2.2 **Youth eco-anxiety**

The findings from this research support emerging literature that suggests eco-anxiety can overwhelm individuals (Kleres & Wettergren, 2017; Li & Monroe, 2019; Ojala, 2021). Cognitive dissonance arises as their understanding of the climate crisis grows along with the realisation that day-to-day behaviours are not changing fast enough to address the crisis. The cognitive dissonance may lead to strategic denial that thwarts climate action (Haltinner & Sarathchandra, 2018; Harmon-Jones & Harmon-Jones, 2019), or cultivate reflection and understanding that something is wrong (Harrē, 2020; Hickman, 2020) - prompting action to address the imbalance (Boler, 1999; Mezirow, 2012). Of interest is that for most strike leaders it was the latter - the emotional pull of eco-anxiety that became a catalyst for them to take climate action. With consideration that these students considered themselves motivated learners, these findings may not be representative of students who are uninterested, disengaged or in denial of climate change.

Interestingly, the climate strike movement in Aotearoa New Zealand was representative of global trends with greater female representation than male. Jake suggested this was because climate concerns required a level of compassion which did not always align with masculine identity. It is unclear from this research whether males felt the same level of climate anxiety as females or what motivating factors would specifically engage males.

Generally, however, strike leaders described youth to be feeling burdened with climate change. Oliana, for example, called it a "massive, massive, massive weight to hold". Tina suggested many are overwhelmed and instead "choose to put their head in the sand." These comments were supported by teachers and the *NZ Herald* (2019c) that reported the strikers were a generation that were experiencing 'impending doom'. Compounding the rapid escalation of eco-anxiety is that research is still in its infancy (Harrē, 2020; Kleres & Wettergren, 2017).

The impact eco-anxiety has on education is fraught (Bolstad, 2021b). Eco-anxiety creates a barrier or challenge for the integration of climate change education in secondary schools, as teachers are often reluctant to include subjects that add to youth angst (Bright & Eames, 2021). In addition, teachers are often navigating their own understanding around climate change and may themselves suffer from eco-anxiety (Verlie et al., 2020). Teachers are reported to be feeling ill-equipped to manage climate anxious students. This creates a conundrum as the lack of adult and educational engagement with climate change compounds youth concerns (Hickman et al., 2021; Teach the future, n.d) and reinforces for youth the perception that adults are out of touch, apathetic towards climate action, and willing to leave the burden of addressing climate change to younger generations.

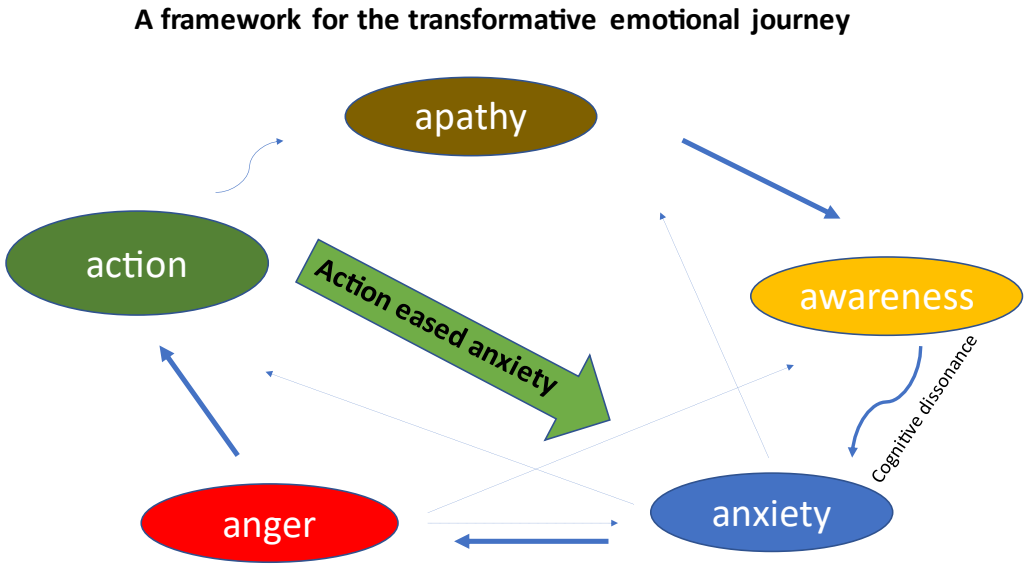
Most strike leaders suggested that, by actively addressing their concerns around climate change, their eco-anxiety was alleviated. This finding was unanticipated, and in regards to motivating students has significance for educators as it supports the concept that eco-anxiety should *not* be considered a deficit emotion, but reframed to show eco-awareness and eco-empathy (Hickman, 2020). Strike leaders showed an awareness that knowledge alone was unlikely to inspire the necessary motivation or policies needed to generate behaviour change (Monroe et al., 2019). While increasing climate knowledge might heighten awareness, it was the profound emotional trigger of a disorienting dilemma (Mezirow, 2012) the climate crisis presents, that had the potential to be transformative.

Youth eco-anxiety illustrates youth concerns around the risks to environmental and societal health from the impacts of climate change. Heightened awareness was described as a 'massive' weight to hold. However, strike leaders also recognised the value anxiety had for encouraging

critical reflection of cultural norms. As with cognitive dissonance theory, in an attempt to restore a sense of equilibrium, more than half the strike leaders credited anxiety as the emotion that was most likely to drive them towards political action. Reflecting on the root causes of their anxiety often led strike leaders to heightened understanding of the need for systemic changes and this motivated individual and collective action.

Anxiety is often cited as a barrier to teaching climate change education but as outlined in Boler's Pedagogy of Discomfort (Boler, 1999), with reflection of the root causes of the discomfort it is possible for anxiety to be used positively and this process may help build action and resilience. Awareness coupled with anxiety often triggered strike leaders to outwardly express their anxiety, release anger, connect with others, educate others, engage politically, and promote the need for climate action. The emotions are not linear and may go backwards and forwards, but they tend to be progressive. It was the entanglement of emotional discomfort (the heart) combined with cognitive dissonance (the head) that led to greater evaluation and synthesis on climate science, climate action (or inaction), political motives, economic and social disparities that propelled strike leaders towards individual and collective action. If action was considered ineffective or unsuccessful, it was possible individuals may revert to apathy. Importantly however, the progression of awareness, through anxiety, anger and on to action were found to ease strike leaders' anxiety (Ojala, 2021; Verlie, 2022). The following diagram shows a model of the emotional journey experienced by strike leaders.

Figure 6.1 *A framework for the transformative emotional journey*



The implication for education is profound. Rather than shying away from climate discussions, eco-anxiety can provide educators with the opportunity to engage students with the climate

crisis. With leadership support (Everth et al., 2021) and pedagogical frameworks (Boler, 1999; Bright & Eames, 2021), teachers may show respect and acceptance of anxieties. Providing a platform for students to acknowledge their emotional state and critically consider the source of their anxiety enables greater reflection and engagement that may lead the individual to consider solution-based strategies. By empowering youth to voice their anxieties, eco-anxiety has the potential to turn apathy into action and encourage a shift towards a state of what is *possible*.

The strike leaders suggested they and other youth were motivated by the power of youth voice and youth agency and this is discussed next.

6.2.3 **Youth voice - Youth-led movement, young role models and friends**

Youth voice, youth leadership and friends were found to support youth agency and engage students with the climate strikes. Yet the findings revealed that youth often feel their voice is dismissed by adults and that the motivational pull of peers is underestimated.

What motivates and engages students may differ from adults (Boulianne, 2020). While every strike leader identified youth voice as a motivator, only half the teachers interviewed suggested youth voice and agency would increase motivation. While this does not mean the other teachers did not consider the youth voice to be valuable or a motivator, they perhaps did not think to mention it. Huia, Josh, Jake and Oliana felt that despite the significant impact climate change will have on their generation, their voices as youth strike leaders were not respected by their school leaders. From a school senior leadership perspective, concern with strike participation centred around keeping students safe or the administrative difficulties when dealing with a mass, youth-led school absence event. Strike organiser, Sophie Hanford summed up the feelings expressed by the strike leaders interviewed for this research when she said, "we have to disrupt some of the norms to actually have our voices listened to" (Radio New Zealand, 2019d). This raises an interesting dilemma about an apparent disjunct between teachers' perceptions and students' reality. In a world that is becoming increasingly unstable, it follows that for secondary schools to enhance student engagement requires greater consideration of student voice and the nature of learning that might be valued or considered meaningful.

Adolescence cognitive, emotional, and behavioural engagement are widely understood to be influenced by peers (Crone, 2017; Wang et al., 2018). The voice of Greta Thunberg, for example, role modelled the possibility that young people could make a difference. Lilly suggested, "you can start to see yourself in them." Friends were also a powerful motivator. Global research identified that 67% of the 2019 climate strike participants were motivated by friendships (de Moor et al., 2020), and the collective agency offered by the strikes enhanced

students' sense of belonging (Havik & Westergård, 2020). Increased positive relationships with peers have been found to boost engagement (Bishop, 2003; Bolstad et al., 2012), suggesting climate change education pedagogies that promote collaborative learning are more likely to engage adolescent learners.

The theme that "schools and teachers struggle with student voice, student autonomy, student agency," as stated by Nathan (Head of Department) was common with both strike leaders and teachers describing a secondary school system that is outdated. Both strike leaders and teachers called for a transformation of school priorities and systems to move away from 'production line' education that hindered 'big picture thinking'. This concept is supported by Braus (2020) who suggested schools have gone awry and lost sight of their core responsibility to equip youth for the future.

Given that youth are facing a world of escalating complexities, environmental urgencies, and growing anxiety (Irwin, 2020; Kwauk, 2020), their lives differ radically from the youth experiences of previous generations. Youth were motivated to take climate action *now* because of rising climate awareness and an escalating sense of unease. The climate strikes provided a platform for youth to raise their voices and in the process challenge historical climate apathy and the lack of climate change education. The strike leaders' interviews revealed articulate and well-informed perspectives, often typical when students are consulted (Nelson, 2017). Yet some secondary schools showed a lack of support for student concerns, student voice, and student agency, by remaining rooted in traditional educational practice and displaying less adaptivity than the adolescents they serve (Freire, 2015; Irwin, 2020).

Secondary school education presents an opportunity to empower youth by supporting their voice and co-constructing a long term, multigenerational approach towards the climate crisis that will go some way towards reducing eco-anxiety and increase motivation towards climate action. These findings suggest that to motivate students, the first step is for educators to listen to youth perspectives, discuss the complexities of climate change and work alongside students to empower their agency (Verlie & Flynn, 2022). The next step is to consider *how* to facilitate a better understanding of climate change that leads to climate action, and this is discussed next.

6.3 How did participation impact learning?

Through the authentic learning experiences of the climate strikes, strike leaders believed that most youth participants enhanced the key competency skills associated with the *New Zealand Curriculum*. Strike leaders believed the strike experience encouraged many strike participants

to become more "confident, connected and actively involved life-long learners" (Ministry of Education, 2007b, p. 7).

Heightened climate awareness and understanding of the need to increase political agency was considered by strike leaders to motivate many youths to protest and to consider how they might take personal or collective climate action in the future. For decades raising awareness of environmental degradation has been an educational aim of environmental conferences and environmental education to encourage behavioural change (Chapman, 2011; Palmer, 2002; UNESCO, 1975; UNFCCC, 2022). It has become evident with climate change that behavioural change has not happened quickly or easily. For individuals to be motivated they generally require competence, autonomy and relatedness (Ryan & Deci, 2000) but also, positive, recognisable, and tangible outcomes (Bandura, 1977), and this is the difficulty with climate change - where no immediate gratification or obviously improved conditions occur.

What was of interest from these findings is that, for the strike leaders, by engaging with climate change content their interest was initiated, but the intense motivation required to commit significant time and energy into leading the strikes was often born from a greater understanding of social justice, indigenous knowledge, and political literacy.

6.3.1 **Raised awareness of climate issues**

The strike leaders suggested the climate strikes raised awareness of climate issues in four distinct ways, firstly, through media coverage, both general and social media. As a result of the increased media coverage, personal and public discussions on climate change intensified. Secondly, regardless of the level of support from the school, the climate strikes prompted classroom discussions on climate change and activism across curriculum subjects. Thirdly, increased publicity and general discussions encouraged individuals to delve into personal research on climate change, some of whom shared their new understanding with friends and family. Fourthly, during the climate strikes the crowds were taught, as Lajos said, "stuff they should be learning in school," with climate science experts broadcasting regular snippets of information to the protesting crowds. Strike leaders expressed concern that for many youths, their primary source of climate information was through social media, which Jake suggested, "might be a stretch to call it knowledge." All participants in this research felt schools had an ethical obligation to relay accurate information and raise awareness of the concerns and impacts of the climate crisis as a first step towards individual and collective action.

Educational research increasingly documents the importance of climate change education for youth but within climate action documents, such as the Aotearoa New Zealand *National*

Adaptation Plan for Responding to Climate Change Risks (Ministry for the Environment, 2022c), formal education is largely omitted. There remains a disconnect between mitigation considerations and formal climate change education that empowers citizens to democratically support climate action rather than have it imposed on them (Eames et al., 2021). As seen during the COVID 19 pandemic, public support for restrictive legislation required the general public to understand the reasons and ramifications behind the legislation as well as the behavioural change that was expected of them.

The climate strikes raised youth awareness as well as general awareness, highlighting climate change considerations that many individuals may not have previously considered, such as the need for Aotearoa New Zealand to offer financial support to the Pacific Islands or investing in just transitioning practices. The ensuing conversations also enabled dialogue on contentious issues that many may feel reluctant to discuss, such as agricultural emissions. Strike leaders reported feeling challenged and excited with these heightened discussions around climate change, which often enabled a transference of knowledge, or a shift of perspective, inspiring more personal research to support their new understandings. This heightened awareness supported greater critical thought leading to a deeper understanding of the complexities of climate change and consideration of potential solutions (Feldman, 2022; Tattersall et al., 2022; White et al., 2021).

The information gained as a consequence of the strikes included improved understanding of climate science, social justice, indigenous knowledge and political literacy.

6.3.2 **The science of climate change**

Strike leaders discussed their personal journey towards taking climate action before experiencing the learning growth associated with the climate strikes. Cognitively understanding the science behind climate change initially piqued strike leaders' interest and raised their levels of concern. However, the raised awareness did not necessarily incentivise action. Learning about the science behind climate change was considered most likely to be taught in secondary schools (Bolstad, 2020c) and deemed important. Even so, many strike leaders suggested that youth struggle to engage with the concept of ecosystem collapse and that this content in isolation, might prompt denial or hopelessness (Haltinner & Sarathchandra, 2018; Hickman, 2020). The challenge for educators is how to raise climate awareness while mitigating the inevitable accompanying anxiety. Of interest for this research, and as discussed in Section 6.2.2, the heightened anxiety from raised awareness was found to become a catalyst for action.

Many of the strike leaders became anxious and felt compelled to engage in personal research that took them beyond the science to the social, economic, and political causes of climate change (Tattersall et al., 2022; Verlie, 2022). Critically, it was the understanding that evolved from this area that heightened awareness of the need for systemic change and motivated strike leaders to become more politically active. To engage youth with the complex understanding needed for climate change issues, strike leaders argued that climate change education must also be framed around social justice.

6.3.3 **Social justice**

Understanding the need for social justice was considered by strike leaders to engage the heart, which was considered a powerful motivator for youth towards climate action. Intergenerational injustice of climate change is central to youth concerns. The impacts of COVID 19 further exemplified the social and economic disparities that have resulted from neoliberal development models (Pelling et al., 2022). With heightened awareness of social justice issues, strike leaders' understanding of the inequitable social and economic burdens expanded to include the projected disproportionate impact on those least responsible for climate change, such as, low socio-economic communities, vulnerable communities, indigenous cultures, and youth (Carleton & Hsiang, 2016; Carter, 2019c; Santone, 2018). This led to the realisation that industrialised nations have comfortably benefitted from lifestyles afforded by a Western carbon intensive culture at the expense of poorer nations, indigenous cultures and non-human species (Leichenko & O'Brien, 2020).

Strike leaders reflected the assertion made by Orr (2020) that successful climate action depended on growing public support that challenges the status quo and creates alternatives to capitalist and neoliberalist ideology. Most strike leaders argued that climate action required not only environmental regeneration but the r/evolution of social, economic, and political systems (Irwin, 2020; Stuart et al., 2020).

The strike leaders showed a sophisticated awareness of the need to balance complex ethical considerations and practical solutions, to ensure transitioning processes will provide equitable outcomes for all (Foran et al., 2019; Ilisko, 2018; Khan et al., 2020). The concept of social justice extended to considering the difficulties associated with facilitating just transitioning processes for high carbon emitting industries, such as the agricultural industry. Formally integrating social justice into secondary school climate change education increases the chances of equitable r/evolutionary climate action permeating throughout communities and the workforce.

Within the social justice paradigm, the strike leaders identified the value of understanding indigenous knowledge suggesting this knowledge should be at the forefront of climate action narratives (McKenzie, 2021; Pou, 2021), and this is discussed next.

6.3.4 **Indigenous knowledge**

Both strike leaders and teachers suggested that understanding social justice included advocating for indigenous knowledge and rights. Understanding indigenous perspectives was considered an ethical and effective component of climate change education and action. The strike leaders showed concern around the Eurocentric-based climate action movement and suggested that listening to the wisdom and learning from the sustainable practices of indigenous cultures, such as Te Ao Māori, was essential for engaging a wider demographic, and for progressing effective climate action.

Teacher participants identified a lack of engagement from Māori students and students from low socio-economic communities. These teachers implied the Western drive for climate action and the climate strike movement lacked relevance for these students. Vulnerable communities and indigenous culture's priorities may differ to Western cultures and Western science alone does not necessarily translate easily for vulnerable or indigenous communities (Morrison, 2022; Smith, 2020). The Western cultural prioritisation of neoliberal and colonial thinking has resulted in a focus on the rights of the individual over the rights of communities or ecosystems. This way of thinking often vastly differs from many indigenous peoples' cultural ways and has left many indigenous communities vulnerable to the impacts of climate change (Carter, 2019a; Whyte, 2020). Traditional Western education has contributed to the highly educated people under which much of the environmental degradation and ecocide has occurred (Orr, 1992). It is difficult to solve a problem using the same ideologies and consciousness that created it (Unwin & Tuterangiwhiu, 2021).

Ironically, even though the climate strike movement heralded indigenous voice and indigenous rights, the Aotearoa New Zealand climate strikes followed an international trend that showed a Eurocentric bias and a lack of cultural diversity within the striking population (de Moor et al., 2020), drawing criticism from indigenous groups in Aotearoa New Zealand (Kay et al., 2021; McKenzie, 2021). The strike leaders considered a cultural imbalance was indicative of the monoculture within Western based climate action and a barrier to just transformative action. Aigagalefili Fepulea 'I Tapua'I, a young Pacific Island strike leader in the documentary film, *High Tide, Don't Hide,* asked "why are there no brown voices in these conversations, on these committees, when this issue is affecting us?" (Wannan, 2021). Climate realities are diverse,

nuanced, and unique. As with climate action, climate change education in multicultural societies, such as Aotearoa New Zealand, has a moral obligation to move beyond a Eurocentric bias and encourage socially just understanding of local and indigenous knowledge, within climate change education (Bright & Eames, 2020; Kopnina & Washington, 2019).

Indigenous cultures have a long history of living sustainably (IPCC, 2022a). As strike leaders gained a deeper understanding of historical injustices and indigenous cultures, the realisation grew that the Eurocentric bias of social and economic constructs such as colonisation and capitalism have contributed to the disproportionate impacts of climate change on indigenous cultures (Albrecht, 2020; Ka'ai-Mahuta, 2011). Indigenous knowledge does not undermine the critical need to grow scientific understanding of climate change but offers diverse ontologies (Pou, 2021; Smith, 2022), and climate strategies to accelerate the wide scale shifts in behaviours and attitudes needed to mitigate and adapt to climate change (IPCC, 2022a; Nuñez, 2018; Stevens et al., 2021).

In Aotearoa New Zealand, with Māturanga Māori (Māori knowledge), climate change education was considered more likely to offer culturally appropriate and locally based understanding, advancing greater diversity and local innovation with climate adaptation and mitigation practices. Diversifying the types of knowledge offered in climate change education may broaden climate change engagement and diversify climate action opportunities (Pou, 2021).

Core to Māori philosophy is Te Taiao, an extensive understanding of the interconnectedness, interdependence, and interrelated nature of all living and non-living things. This is what Verlie (2017) referred to as ‘entanglement’ - the understanding that humans are not separate, but are *part of* the environment. This concept was central to Māori who fought for protection for the Whanganui river – arguing that if we damage the river, we damage ourselves (Lurgio, 2019). Understanding this interconnectedness will encourage a cognitive and spiritual shift away from the Anthropocene, a period where humans have dominated (Steffen et al., 2018), towards the Symbiocene, where the life of humans are part of “the symbiotic and mutually reinforcing life-reproducing forms and processes found in living systems” (Albrecht, 2020, p. 21). Such thinking reflects an inclusive philosophy, by showing concern for the rights of all living things and ecosystems for their own sake, not as resources to be exploited, and is expanding in Western literature (Kopnina & Washington, 2019; Wienhues, 2020). This is an example of Western philosophy catching up with indigenous ‘knowing’.

Enhanced understanding of indigenous knowledge challenges assumptions and contributes to diversity of perceptions, experiences, and opportunities (New Zealand Government, 2022; Stevens et al., 2021) that may motivate those who are currently disengaged. With a greater understanding of the need for socially just and culturally inclusive climate action, strike leaders in this research were motivated towards political action (Stuart et al., 2020).

6.3.5 **Raised political agency**

The climate strikes provided a platform for strike leaders to increase their political literacy and political agency and in doing so empowered them to become agents of change. Most strike leaders reported feeling politically naïve prior to the climate strikes. Teachers also observed that many students enhanced their political understanding and agency through the climate strike experience. Teachers and strike leaders considered this an unexpected but valuable outcome of strike participation. Many strike leaders argued that to become a change maker, first you must understand the political forces that shape society (Beals & Wood, 2012).

Youth have traditionally been disregarded as political contributors and this has marginalised provision for political literacy in education (Brocklehurst, 2015). The *New Zealand Curriculum* Social Sciences Learning Area recommends students explore "how societies work and how people can participate as critical, active, informed and responsible citizens" (Ministry of Education, 2007b, p. 30). Greater political agency has the potential to positively impact academic engagement (Ballard et al., 2019). However, teaching an understanding of political literacy that leads to agency in Aotearoa New Zealand secondary schools was considered largely absent by both students and teachers in this research. The irony is, when youth did show an interest in politics, they often felt patronised (Reeves, 2017), or that their agency is being regulated by adults (Gordon & Bluebond-Langner, 2009). This was the experience of seven out of 15 strike leaders who felt unsupported or punished for their involvement in the climate strikes.

Understanding the historical connections between the environment, the economy, and politics encouraged deeper and more critical thinking. Increased sophistication of understanding increased interest in civic and political activities. With consideration of the climate crisis, strike leaders gained a greater understanding that widespread political pressure is required to encourage mainstream politics to unilaterally adopt climate policies, suggesting that systemic change was more powerful and far-reaching than climate action that only focused on individual behaviours (Act for Youth, 2022; Astor, 2019; Orr, 2020). Even though individual actions to mitigate climate change were considered important, collective action was thought to ease

pressure on individuals and would hasten the shift of political priorities towards a zero-carbon society.

Transformative education for strike leaders was brought about by a blend of the head, heart and hands empowering collective political efficacy of students. Heightened publicity of the mass climate movement grew awareness and motivated many to take unprecedented political action. The success of the action reinforced for individual's the power they may have to drive collective political action. While the climate strikes targeted political and societal transformations, for strike leaders the climate strikes also highlighted the need for transformative education in secondary schools.

Strike leaders suggested the dramatic and rapid societal changes instigated to combat COVID 19, showed the power and flexibility of government when sweeping behavioural changes are deemed necessary and publicly mandated. Strike leaders hoped legislation could also be implemented to support mitigation strategies for climate change. For example, the Zero Carbon Amendment Bill (2019) became law in November 2019 and was the first significant piece of legislation from the Aotearoa New Zealand government to combat climate change (Cooke, 2019). The strike leaders led and encouraged youth to utilise their democratic rights and make submissions supporting the Bill and were further encouraged when James Shaw (Deputy Prime Minister and Minister for Climate Change) commented that the passing of the Bill was, in part, because the climate strikes raised climate awareness and that youth applied political pressure to government. Political literacy and agency gained from the climate strikes, empowered strike leaders to understand that even though they were too young to vote, collectively their youth voice held some political sway (Bright & Eames, 2020; Ignell et al., 2019). Enabling the tools and confidence to take political action demonstrates the potential to grow a politically engaged generation (Wenmonth, 2014).

This research identified that strike leaders and teachers believed the climate strikes raised general awareness of the climate crisis. Of interest for educators is that while cognitively understanding climate change science was considered important, in isolation it raised anxiety and could lead to denial or despair. Growing an understanding of social justice, indigenous knowledge and experiencing political agency was critical for greater youth engagement in climate action. The specific educational outcomes for youth who participated in the climate strikes are discussed next.

6.4 Student and teacher perceptions of educational outcomes

The strike leaders felt that their educational outcomes from being strike leaders surpassed the learning experiences they had at school. This was because the learning was authentically connected to their interests, developed skills needed for their adult lives and was therefore meaningful and practical. These experiences were often considered to contrast secondary school educational experiences that strike leaders suggested were disconnected from students' lives and interests. The comment from Lilly that her experience as a climate strike leader showed "just how much they don't teach you in school, actually really valuable life lessons they just don't teach you in school," was supported by most teachers who also felt secondary school inadequately prepared youth for their future civic responsibilities as well as a lack of future preparedness for climate change. This section discusses both strike leaders and teachers perceived educational outcomes of the climate strikes.

6.4.1 Strike leaders' perceptions of learning outcomes

The strike leaders who were interviewed reported themselves to be enthusiastic learners and considered themselves motivated and academically able. I found them to be well informed and eloquent speakers and believe many are likely to become leaders in the community. One of the key criticisms of the climate strikes from adults in the media was not that students were taking climate action but that they *were taking time off school* to take action (Hosking, 2019; Radio New Zealand, 2019a). Critics appeared to believe that school was the most important place to prepare youth for their future. Youth saw it differently. The lack of relevance in class lessons to their lives was the cause of frustration for strike leaders. This opens the question of content relevance for students who considered themselves less academically aligned with school expectations than the strike leaders. I concur with Verlie (2022) that the climate strikes provided a context for strike leaders to question societal needs and current schooling practices. The strike leaders' perceptions of secondary school supports the view that schools are currently *not* providing what students need for their unpredictable futures (Bolstad et al., 2015; Everth et al., 2021; Kwauk, 2020; Orr, 2020; Tattersall et al., 2022; UNESCO, 2021; Verlie & Flynn, 2022; White, 2012). Leading the climate strikes offered learning that was meaningful and relevant to the strike leaders.

These educational outcomes consisted of practical skills as well as heightened critical and cognitive functioning. Examples of practical skills included: understanding traffic control, health and safety, financial management, working with police and within the law, communication skills, media skills and leadership skills. Strike leaders commented that their experiences enhanced cognitive complexity such as improved critical thinking, creativity,

strategising, time management, prioritising, problem solving, and collaboration. These skills are significant as they align with the key competencies in the *New Zealand Curriculum* (Ministry of Education, 2007b) and the global framework of the *Belgrade Charter (UNESCO, 1975).*

The engagement that led to these educational outcomes encouraged youth to think deeply about their values and personal growth. The emotional and intellectual growth that occurs during the adolescent years contributes significantly to the development and consolidation of values as youth move away from adult role models and towards independence (Barni et al., 2011; Crone, 2017). Curiously, adolescence is also a time when many students' interests in, and concern around, environmental issues have been reported to decrease (Eames et al., 2018; Olsson & Gericke, 2016). But the climate strikes appeared to have the opposite effect being equally educational and motivating, inviting youth to consider what their values are and what they stand for – individually and collectively. According to Bolstad (2021a) it is this fostering of values, attitudes, knowledge, and skills that empower individuals to focus on solutions, not problems that support a transition to a socially just, zero-carbon future.

The climate strikes heightened strike leaders' awareness of the vacuum around formal climate change education and they became climate change educators for their peers (Verlie & Flynn, 2022). This role had educational value as it helped to heighten their own understanding of climate change but also increased their frustration with the education system, because they felt it lacked relevance to their future. Youth expressed how they desperately wanted adults, leaders' and educators to move beyond apathy, walk beside them and engage in this critical conversation (Tattersall et al., 2022). The Māori concept of tuakana-teina (reciprocal learning opportunities) (Rameka, 2017) supports such a process where teachers and students support each other on their educational journey.

The strike leaders suggested that participation in the climate strikes enabled youth to be connected, confident and actively involved in their community, which are qualities emphasised by the key competencies in the *New Zealand Curriculum* ((Ministry of Education, 2007b). The value based, contextual learning of the climate strikes provided a meaningful backdrop to enhance learning experiences (Herranen et al., 2019). The cognitive and academic learning was spurred on by the emotive and contextually placed engagement, described by many strike leaders to resemble 'energy in action' (Appleton et al., 2006, p. 428). This engaged and motivated state of doing, thinking, and feeling (head, heart and hands) (Zepke, 2018), encouraged students to ardently seek out more information and prompted action on a personal and collective level. An underlying message emanated from the strike leaders that if educators

wish to grow student engagement in climate concern, they must also show interest and put greater emphasis on emotional and contextually-based learning. The teachers' perceptions of learning outcomes are discussed next.

6.4.2 **Teacher's perceptions of learning outcomes**

The teachers agreed with the strike leaders' perceptions that student participation in the climate strikes offered valuable learning outcomes for many striking students, as well as for some of the students who stayed at school. Firstly, the students' climate change awareness heightened due to the intense media coverage of the climate strikes, and this sometimes spurred classroom conversations on climate change that were unlikely to have occurred previously. Secondly, they witnessed an awakening of students' political consciousness and agency. This was significant because for ethical transformations to occur, an understanding of the relationship between political influences and individual or societal choices are required to develop the realisation of the impact personal choices have over time (Brocklehurst, 2015). The climate strikes heightened awareness that political forces and climate change are entwined (Stuart et al., 2020).

Secondary students are too young to vote and consequently, the political voice of youth is often dismissed (Blakemore, 2018) with provision for political literacy within education being marginalised (Brocklehurst, 2015). Teachers suggested the heightened political awareness gained from the climate strikes placed a spotlight on the dearth of political literacy education currently happening in secondary schools. The democratic process of protest empowered youth towards political action and agency. Teachers suggested that students who participated in the strikes thought deeply and critically, making connections between political, cultural, economic, and social history. Taking action politically was thought to develop skills such as critical thinking, reflection of values, strategizing, and problem solving that have also been advocated for climate action (Bolstad, 2020c; Gough, 2015; Ministry of Education, 2015b). The building of political knowledge and skills led students to believe they can make a difference (Şan & Gedikler, 2020) and this was considered the most important outcome of the climate strikes by the teachers.

Both strike leaders and teachers agreed the climate strikes evoked a greater understanding of the climate crisis and greater awareness of political power within the student population. An underlying message from strike leaders was that education is currently out of touch with student needs and the comments from many teachers supported this concern. This leads to the heart of this research, to explore what educators can learn from the climate strikes to improve

pedagogical practices and how to better engage students in secondary school classrooms with climate change education.

6.5 What can secondary school educators learn from the climate strikes?

The climate strikes exposed global youth concerns over the lack of climate action but also, the findings from this research show that the climate strikes placed a spotlight on our education system. Striking students prioritised activism over education. School leaders and politicians who suggested a day at school was more important than climate activism confirmed a youth perception that a gulf exists between some adults and youth realities (Tattersall et al., 2022; Verlie & Flynn, 2022).

Both strike leaders and teachers suggested the climate strikes indicated that a future-focused education system will aspire to students leaving school with a greater understanding of climate change and political agency than they currently do. Strike leaders called for secondary schools to recognise the threat climate change has on the wellbeing of youth and to build capacity within schools to deliver climate change education. Building capacity includes finding space within the curriculum for climate change education, providing initial and practicing teacher professional learning about climate education (Everth et al., 2021), supporting teachers to feel comfortable teaching climate change (Bolstad, 2020b), encouraging pedagogies that deepen critical thinking (Ahmad, 2021; Freire, 2015), and aiming for a zero-carbon school environment (Bauld, 2021; Sadan & Alkaher, 2021).

The strike leaders' personal climate learning experiences encouraged greater critical thinking and focused their lens on the need for systemic change. Strike leaders suggested effective pedagogies would foster critical evaluation of the social, economic, and political systems to gain a more holistic understanding of the challenges and opportunities faced with climate change and empower transformative strategies. Engaging pedagogical practices were considered to focus on a balance between the head (academic), the heart (socio-emotive), and the hands (practical) (Monroe et al., 2019; Ojala, 2021).

6.5.1 Systemically building climate change capacity in secondary schools

The findings in this research supports emerging literature that the climate strikes brought educational priorities under a critical lens (Kwauk, 2020; Verlie & Flynn, 2022). Secondary schools were considered *out of touch* with students' needs in the age of climate change (Hickman et al., 2021; Irwin, 2020).

Secondary schools are an integral part of the community (Haque, 2014) with community interaction and engagement considered a valuable principle in the *New Zealand Curriculum* (Ministry of Education, 2007b). By pivoting educational priorities towards examining the systemic and transformation role secondary schools play in the future wellbeing of their students, secondary schools can offer a critical and currently untapped resource that supports the societal transformations strike leaders were calling for - to address the challenges presented by climate change (Bolstad, 2020a; Plutzer et al., 2016; Verlie & Flynn, 2022).

The New Zealand Curriculum outlines the value of ecological sustainability, yet the voluntary stance and lack of guidance has proved largely ineffectual for climate literacy (Bolstad, 2020a). Mandated policies do not necessarily mean the curriculum is enacted, however, curriculum endorsed learning provides an expectation of best practice regarding teaching and learning approaches, content and skills' development. The recent reset of the history curriculum to more accurately represent Aotearoa New Zealand's bi-cultural history provides an example of a wide scale Ministry led directive that will impact educational content and enhance bi-cultural understanding in Aotearoa New Zealand (Panel, 2021). Similarly, the current Curriculum Refresh (Ministry of Education, 2021c) provides an opportunity for incorporating a climate change lens - across curriculum learning areas. For schools who require practical support, many outsourced environmental education groups, such as Enviroschools, offer expertise and resources for environmental, locally based cross-curricular programmes that connect students with planetary systems and wellbeing.

While strike leaders reported that some schools' board of trustees and principals embraced the educational opportunities presented by the climate strikes and these schools may support a shift towards embedding climate change education, many are too enmeshed in the day to day running of the school or feel stymied by community expectations and Ministry of Education procedures to consider a focus on climate change education (Bolstad, 2020a). Further challenges arise for leaders whose schools are governed by communities who consider climate action might undermine the community's economic prosperity or lifestyle. The introduction of mandated climate change education expectations would support these leaders, encourage leadership accountability (Leichenko & O'Brien, 2020), and wider community awareness that for the sake of their students' future, climate change education is non-negotiable (Bolstad, 2020a; UNESCO, 2021; Verlie & Flynn, 2022).

The youth perception that adults have abandoned their responsibilities to future generations with climate inaction is compounded by a lack of climate education in secondary schools. Arguably, students are the education sector's 'clients', who are applying pressure for adults to

be more climate proactive. Building capacity within Aotearoa New Zealand secondary schools' systems to facilitate a 'think globally - act locally' (Eames & Barker, 2011; Kasza & Slater, 2017; Monroe et al., 2019; United Nations Sustainable Development, 1999) climate learning context demands that the educational lens focuses on what youth consider the most pressing concern for *their* future. A learner-centred approach to education would require the Ministry of Education and school leaders to listen to youth concerns and share a vision that prioritises future wellbeing.

Of interest from these findings is that while only half the teachers interviewed for this research had previous interest in environmental education, all teachers appreciated youth concerns and supported a shift towards systematically embedding environmental and climate change education into secondary school learning. The proviso was, however, that for widespread and effective integration it needed to be steered from the 'top down' and driven by school leaders. Barriers to climate change education such as lack of curriculum emphasis, time, resources, and professional development opportunities (Bolstad, 2020a; Everth & Bright, 2022; Service & Thornton, 2019) were identified and mean that climate change education will continue to be sporadically laboured by passionate teachers if not enabled through bold, proactive leadership.

6.5.2 **School Leadership**

The 2019 climate strikes revealed the significant impact leadership had on teacher actions and student agency, which depended on the school stance to the climate strikes. Secondary school leaders are crucial for determining the shape and vision of the school culture (Eames et al., 2021; Gardner-McTaggart, 2020). The interactive and reflective nature of schools within their communities can positively impact a localised response to climate change (Bolstad, 2020a; Lawrence et al., 2015; Li & Monroe, 2019). School leaders are in a unique position to assertively prioritise understanding of climate change and work alongside students to support localised, innovative, climate mitigation and adaptation solutions.

The climate strikes polarised and challenged many school leaders as they attempted to manage students in an unprecedented event (Everth & Bright, 2022). The leaders who fostered a culture of support for students to participate in strike action empowered the students to gain a greater understanding of climate change, political agency, and belief their voices were valid, and that they could make a difference. The strike leaders (and teachers) who experienced a lack of support from school leadership questioned the relevance of a school system and power structure that appeared alienated from youths' core concerns. Strike leaders reported support from most

of their teachers - it was the stance of the school principal that usually determined the level of practical support they received from the school.

Secondary school leaders have a complex role that must consider multiple needs and are often a conduit between students, teachers, parents, neighbouring properties and local businesses (Alonso-Yanez et al., 2021). But, primarily the role of school leaders is to *improve the outcomes for students* (Ministry of Education, 2022b). The responses to COVID 19 showed the potential within schools to quickly adapt systems when considered necessary for student wellbeing (Rincones et al., 2021). Similarly, school leadership has the authority to leverage effective climate change education in the secondary school system that can shift cultural norms and traditional systems (Glasgow, 2019).

6.5.3 **Critical pedagogies – head/heart/hands**

Leadership support for critical pedagogies will enhance holistic understanding and engagement with climate change education. The strike leaders reported their climate activist journey involved diverse learning that can be found with critical pedagogies to engage the head, the heart, and the hands. This learning fostered the type of critical thinking that the complexities of climate change necessitate. Critical pedagogies aim to empower students to become active agents in social change by encouraging critical awareness, critical reflection, critical analysis, and critical action (Boler, 1999; Eley & Berryman, 2018).

To enhance classroom engagement, some strike leaders suggested the academic focus should be more balanced to include socio-emotive and practical learning in ways that were personally meaningful and relevant to youths' concerns (Monroe et al., 2019). While strike leader Jake argued that the profile and academic status of climate change education could be raised by offering more assessment opportunities, he also juxtaposed this suggestion with a call for a greater balance of academic opportunities to work alongside socio-emotive and practical learning.

The strike leaders' learning experiences via protest action supported the practice of informal and transformative learning through social movements (Crowther & Shaw, 1997). Critical pedagogies are often contrasted with traditional cognitive based, Eurocentric and individualistic pedagogical practice that Freire referred to as the 'banking model' (Freire, 2015). The awareness raised as a result of the climate strike publicity encouraged youth to consider and potentially critique societal norms in regard to environmentally sustainable practices and prompted many to join the strikes.

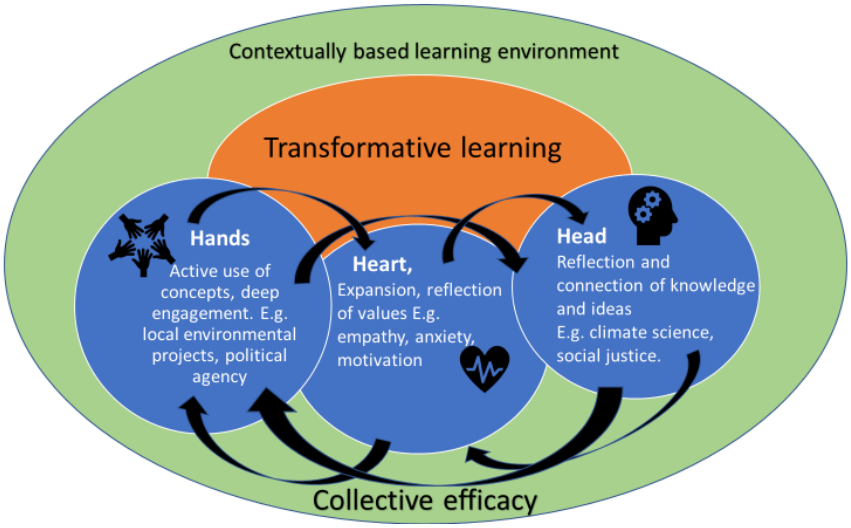
The strike leaders' enhanced knowledge and skills gained from becoming leaders often prompted reflection and critique of their secondary school learning experiences that they considered were more likely to support cultural reproduction of the prevailing neo-liberalist practices. The learning that occurred because of their role as strike leaders was considered transformative (for example, Madison's experiences encouraged her to turn down a tertiary scholarship to study design in favour of studying political and environmental studies). The strike leaders described their learning as working collaboratively with each other, using cognitive, emotional, and hands-on learning that were situated in an authentic environment. This process aligns with the head, heart and hands pedagogy proposed by Orr (1992) to enhance eco-literacy.

The strike leaders did not explicitly refer to their learning experiences as 'head, heart and hands', but described the importance of emotional and hands-on learning to support cognitive development and reflection. Although the curriculum supports this type of holistic pedagogy, what is of interest from these findings is that 12 of the strike leaders suggested this holistic style of learning contrasted with their classroom experiences that were often dominated by cognitive processes and written assessments. The disparity between learning inside the classroom and their informal learning experiences as strike leaders prompted reflection and frustration with their experiences in the classroom echoing Verlie's (2022) proposition that the climate strikes also provided a day of reckoning for education.

Contemporary teaching practice has moved away from teacher-centred approaches towards student-centred pedagogies such as inquiry learning (Herranen et al., 2019), culturally responsive and co-constructed practices (Berryman et al., 2013). However, the findings from this research suggested the strike leaders felt their school learning experiences were adult directed and were often not representative or relevant to students' lives or interests. This was supported by the Drama Head of Department, Nathan, who said "we don't teach people, we teach subjects", expressing doubt over the common integration of student directed learning. Less student directed learning may, in part, be the result of educators' concern that not all students possess the level of ability needed to self-regulate and engage with self-directed learning (Fobes & Kaufman, 2008; Reinsfield, 2018), and this is a valid concern. The strike leaders recognised they represented a small portion of the student population who showed independence and had developed sophisticated problem-solving skills to complex issues. Nevertheless, they suggested a more student directed, critical, pedagogical style of learning would foster wider and more authentic learning experiences to improve outcomes for most students.

For strike leaders their personal research into climate change aligned with a Freirean transformative critical pedagogical process as a result of the flow between, and engagement of, the head, heart, and hands. Their learning was contextually and authentically based and thus strengthened the intersection of thinking, feeling, and doing. For example, as the strike leaders understanding of climate science, social justice and indigenous knowledge grew, so did their anxiety, their cognitive dissonance, and their reflection of values. Reflection often motivated a desire to learn more about climate science and climate action while also prompting environmental or political action. Taking action developed skills and encouraged, further cognitive processing. The internal processing was both reflective and iterative connecting the head, heart, and hands. Collaboration with other strike leaders further extended and supported the cognitive, emotive and practical learning elements and promoted collective efficacy. The three domains did not represent siloed learning, instead each motivated and maintained a backwards and forwards flow between the head, heart and hands as represented in the diagram below.

Figure 6.1 *Intersection and flow of head, heart and hands transformative learning*



Importantly, for youth the three elements work simultaneously together to encourage continual reflection in response to the stimuli of their surrounding environment - just as eco-systems do. Transformative pedagogies apply cognitive, emotional, and psycho-social processes that build capacity for critical thinking to explore dilemmas and encourage a shift of perspectives beyond the epistemological process of changing a worldview to an ontological shift of being *in* the world (Vare & Scott, 2007). Understanding that human wellbeing is entwined with planetary health is particularly relevant in Aotearoa New Zealand as this way of being aligns with Te Ao Māori where culturally the core values show understanding of the interconnectedness of human beings with eco-systems.

The hallmarks of critical pedagogy are collaborative learning, an emphasis on social justice, reflecting on values, critical analysis of the status quo, challenging injustice, and taking action (Ahmad, 2021; Boronski, 2021). These stages aligned with the learning experiences described by many of the strike leaders and the steps they considered important for greater engagement of youth towards climate understanding and action.

The overriding message from strike leaders was that holistic climate change education requires the learner to progress beyond simply knowing about climate change to critically reflect on their ecological citizenship. Verlie (2017) suggested this includes understanding the interconnectivity, or entanglement, of all living and non-living systems. The sense of connectivity between the people, the land, the atmosphere and the oceans, is central to Te Ao Māori (He Pou a Rangi Climate Change Commission, 2021a; Pou, 2021). Understanding social justice and indigenous knowledge includes developing respect for the rights of non-human species, which encourages socio-emotive engagement to activate the heart, and more likely to motivate authentic, long-term action (Ojala, 2015; Pihkala, 2020).

Political literacy and local environmental action encouraged practical, hands-on learning that was engaging and more likely to raise political agency for youth. As with Te Ao Māori, the strike leaders advocated understanding interconnectedness to provide a more holistic, and realistic appreciation of how the climate crisis has transpired, the challenges ahead as well as potential equitable solutions.

What educators can learn from the climate strikes is that youth are anxious about their future and are demanding accountability and climate action from adults. This includes providing appropriate and relevant education that considers social justice, indigenous knowledge, and political agency. Such approaches will be more likely to develop critical thinking and problem skills that encourage individual and collective action, to mobilise just societal transformations (Nairn, 2019). Understanding the need to take climate action requires holistic knowledge of the climate crisis, by utilising critical pedagogies that balance the head, heart, and hands to engage a wider audience and motivate action. A greater understanding of climate change that leads to climate action will help to relieve the eco-anxiety currently felt by many students. Educational leadership plays a crucial role in shaping the educational praxis and culture of their school and must prioritise improving outcomes for students. Time is running out; a future-focused education sector can no longer justify delaying the implementation of climate change education. In this research the voices of strike leaders were supported by teachers in their call for building capacity and integrating climate change education into secondary schools to ensure our societies are better equipped for the climate altered future.

6.6 **Conclusion**

The climate strikes of 2019 provided a platform for youth voice and motivated millions of youths worldwide to leave their classrooms and demand climate action. In-depth interviews using a critical theory lens explored the experiences of strike leaders and teachers in Aotearoa New Zealand to increase understanding of how secondary schools could further enhance climate change engagement with students to motivate climate action. This research utilises youth perspectives and offers a theoretical contribution to the field of critical pedagogies, particularly the role of emotions such as anxiety may play in motivating or demotivating action.

Youth are highly anxious regarding their unpredictable and climate altered future. They feel frustrated by the climate inaction demonstrated by adults, who they perceive have neglected their responsibilities to safeguard their future. The historic apathy to climate change education has resulted in secondary schools being ill-equipped to educate and prepare youth for the impacts of climate change. A lack of reliable, holistic climate understanding has added to youth anxiety and led to feelings of frustration with a school system that appears out of touch with their needs.

The conversation is no longer *why* we need climate change education but *how* best to deliver it. The findings from this study have indicated that anxiety was key in prompting strike leaders to research and enhance their understanding of the social, economic, and political influences that have contributed to the climate crisis. This learning proved to be pivotal for the participant of strike leaders as it fostered the realisation that climate action requires a shift in economic and political priorities. The realisation motivated political activism and the desire to become agents of change, echoing emerging literature pointing to climate anxiety being a catalyst for action. Critically, enhanced political agency combined with collective climate action eased strike leaders' anxiety. Further research is now needed to explore how anxiety can enable youth engagement and how authentic environmental or political action may alleviate climate anxiety.

The success of climate strikes was largely attributed to a youth-centred movement. The climate strikes indicated the motivational force of friends, youth role-models, and youth voice, to empower and motivate students. The role of youth voice in curriculum planning and educational settings to enhance classroom political and environmental engagement, requires further exploration. Engaging secondary school students involves utilising authentic learning experiences that are relevant to the lives of youths.

The research participants recognised the vital role of school leadership in determining the culture of their school and called for courageous leadership that supports and guides holistic climate change education within the school environment.

The curriculum planning insights gained from this research included the need for creating capacity for climate change education, based on holistic pedagogical approaches that enhance critical thinking and reflection. Learning that balances the use of the *head, heart, and hands* is more likely to engage students. Climate science and critical thinking engage the head, which has the potential to increase climate change awareness. Awareness of social justice and being more cognisant of indigenous knowledge is more likely to engage the heart, particularly for students who are disengaged by science. Understanding the need for social justice became a strong motivational driver for strike leaders to take action. Enhanced political agency and involvement in local environmental initiatives engages the hands and grows youth agency, empowering a belief they can make a difference.

Secondary schools are yet to fully realise the transformative potential and key role they hold in regards to addressing climate change challenges and providing opportunities for their students. The 2019 climate strikes empowered youth politically to voice their concerns and called for adults to take ethical and societal responsibility for widespread and just climate action. For these changes to occur, essential knowledge and skills are required to support the societal preparations and transformations needed for climate disruptions and to address the disconnect that often occurs between attitudes and behaviours. This research showed that although many youth are aware and concerned about the looming climate crisis, adults and the education sector appear less cognisant of the need for climate engagement. An effective and future-focused education system in Aotearoa New Zealand needs to prioritise the role that education has in transitioning future generations to an equitable zero-carbon society.

6.7 **Implications**

This research has implications for educational practice, policy and research.

6.7.1 **Practice**

As educators, our priorities must be to respond to the needs, and therefore voices, of youth for the future wellbeing of our communities.

The understanding gained from exploring youth voice, to inform educators about students' motivation to take climate action have significant and urgent implications for senior school leadership and boards of trustees. School leaders have both the authority to empower their

school environments and partner alongside their local communities and iwi (Māori tribes) to connect and integrate appropriate, place-based climate change education. Youth are anxious about an increasingly unstable world. Leaders and teachers in secondary schools must prioritise the wellbeing of students and create educational opportunities to ease youth anxiety by utilising proactive critical pedagogies that promote environmental and political agency. While many elements of climate change education will remain consistent, education that considers the specific geography, culture and opportunities of the local school community is more likely to engage students and encourage meaningful action. Within nature, diversity offers strength. Similarly, climate change education that acknowledges intergenerational, inter-departmental, cross-cultural, and cross-curricular connections will provide a more holistic educational experience and engage a wider audience.

The implications for classroom teachers have been discussed in detail. Fundamentally, however, teachers who are themselves engaged, are more likely to engage students. To assist youth to address and understand environmental and climate change issues, teachers must first be supported to raise their understanding, motivation, and skills towards facilitating transformative learning. This may be challenging for many teachers, and for some will require a shift in teaching praxis that allows for both student and teacher vulnerability and could include strategies such as tuakana-teina (reciprocal learning opportunities). Strike leaders and teachers perceived the educational outcomes of participation in the climate strikes aligned with *The New Zealand Curriculum's* key competencies, as significant learning opportunities, while also awakening and empowering climate action. The climate strikes appeared to have most empowered youth because they were run *by* youth *for* youth. Relevant and authentic learning is more likely to occur with pedagogies that allow for students to co-construct learning opportunities with teachers and that offer critical reflection. As awareness for climate change education accelerates, so should the range of teaching resources available to schools. The use of diverse teaching strategies that balance the *head*, *heart*, and *hands* are more likely to engage a wider range of students.

6.5.2 Policy

The associated implications for national educational policy are also significant. The Aotearoa New Zealand government has finally recognised the enormity of climate change by declaring a climate emergency and passing the Zero Carbon Act (2019). However, imposing climate policies on an uneducated population is unlikely to gain the necessary support. The untapped potential of formal education as a mitigation strategy is not yet acknowledged nor fully realised. The *Emissions Reduction Plan (Ministry for the Environment, 2022a)* and the *National*

Adaptation Plan (Ministry for the Environment, 2022b) lacked formal educational thinking or possibilities in their planning. This is a serious omission and must be corrected for widespread engagement and understanding of adaptation and mitigation strategies to occur.

The Aotearoa New Zealand Ministry of Education is tasked with directing educational providers and ensuring leaders and teachers have the support and resources needed to deliver education effectively. This body has the influence to direct widespread educational shifts, as it has done recently with the introduction of Māori history into the curriculum. The current refresh with *The New Zealand Curriculum* and *Te Marautanga o* Aotearoa (Ministry of Education, 2021c) aims for greater relevance and future-focused guidelines for educators and provides a timely opportunity to acknowledge the voices of youth with greater integration and support of climate change education.

The implications of this research also support the call from Everth et al. (2021) for a national Climate Change Education Council (CCEC) to lead and research educational initiatives, provide consistent climate education messaging, and coordinate a governmental education response. A nationally-based CCEC working within the principles of Te Tiriti o Waitangi would foster impactful relationships between students, teachers, and researchers. It would offer regional support to communities, iwi (Māori), educational leaders, teachers, whānau (family) and parents by offering resources, learning opportunities and curriculum design that incorporates mātauranga Māori, as well as the latest scientific and technological developments. The CCEC could unify educational opportunities and support secondary schools to fulfil their social obligation to prepare students, and therefore their communities, for a climate-altered future.

This research reinforces the call for policy makers to reimagine education and for educators to actively support the voices of youth by demanding the escalation of climate change education to collectively transition towards a climate stable and climate just world.

6.5.3 Further research

The strike leaders interviewed in this research were a small representation of youth. While culturally diverse, they represented-academically able and environmentally interested students. This could be considered a limitation of this research. Research is now needed that explores the youth voice from the perspectives of those who might be less engaged in class, those disconnected from environmental concerns, students from low social-economic communities, and/or indigenous cultures. These demographics may be harder to access for educational research, but the current lack of such disadvantaged and disengaged student voices leaves a

significant gap in the literature, and for understanding of climate change education. My findings imply that Western climate change activism and research are Eurocentric, female, and middle-class dominated. Listening to non-Western voices and considering avenues other than Western-based research is essential as the inclusion of indigenous voices is vital for progressing equitable climate education and action.

Further research is needed to consider climate education and to explore the role of youth voice in classroom engagement, on engaging males with climate change education, considering how anxiety can be turned into action, on actions that alleviate anxiety, and on the disconnect between youth and adult climate perceptions. Finally, researching student outcomes and pedagogical practice in secondary schools that are successfully integrating climate change education could lead to the development of valuable resources to support schools who are motivated to embark on their climate education journey.

6.3.4 Final words

Environmental advocate and lawyer, Gus Speth, stated 30 years ago that the greatest environmental concerns were biodiversity loss, ecosystem collapse, and climate change. He believed that with rigorous science these problems could be addressed. Now he considers the greatest environmental concerns to be human apathy, selfishness, and greed, and if we are to successfully manage the climate crisis, society needs a cultural transformation (Speth, 2015). The findings from this research supports Speth's call for societal transformation and Freire's assertion that individuals and society are constructed through education (Freire, 2015). Education plays a fundamental role in enabling society to address the most challenging concerns faced by humanity. Aotearoa New Zealand secondary schools can no longer procrastinate on climate change education. Three years on from the first climate strikes, on 23rd September 2022, thousands of youths across the globe have again left their classrooms to protest the continued lack of meaningful climate action. Youth are keenly aware of the intensifying heat waves, fires, droughts, floods, and biodiversity loss and are demanding accountability and action. The need for transformative education that guides understanding of regenerative and just transitioning practices towards a zero-carbon culture has never been greater. Educators must listen to the urgent cries of youth and act swiftly and boldly. The choices we make today will define the wellbeing of our students and our planet for tomorrow and beyond.

References

1 NEWS. (2019). *'Not going to help the world one bit' Judith Collins says as MPs voice opinions about school students' climate change protest* https://www.tvnz.co.nz/one-news/new-zealand/not-going-help-world-one-bit-judith-collins-says-mps-voice-opinions-school-students-climate-change-protest

Act for Youth. (2022). *What is youth engagement, really?* Cornell University Bronfenbrenner Center for Translational Research. http://www.actforyouth.net/youth_development/engagement/

Agee, J. (2009). Developing qualitative research questions: A reflective process. *International Journal of Qualitative Studies in Education*, *22*(4), 431-447. https://doi.org/DOI:10.1080/09518390902736512

Ahlin, E. M. (2019). Semi-structured interviews with expert practitioners: Their validity and significant contribution to translational research. In. London: SAGE Publications Ltd.

Ahmad, S. W. (2021). Exploring the perceptions of secondary school teachers about critical pedagogy at secondary school Level. *International Research Journal of Education and Innovation*, *2*(2), 337-342.

Aikens, K., McKenzie, M., & Vaughter, P. (2016). Environmental and sustainability education policy research: a systematic review of methodological and thematic trends. *Environmental Education Research*, *22*(3), 333-359. https://doi.org/10.1080/13504622.2015.1135418

Alakavuklar, O. N., & Dickson, A. (2016). Social movements, resistance and social change in Aotearoa/New Zealand: An intervention for dialogue, collaboration and synergy. *Kōtuitui: New Zealand Journal of Social Sciences Online*, *11*(2), 83-88. https://doi.org/10.1080/1177083X.2016.1192047

Albrecht, G. A. (2020). Negating Solastalgia: An Emotional Revolution from the Anthropocene to the Symbiocene. *American imago*, *77*(1), 9-30. https://doi.org/10.1353/aim.2020.0001

Alonso-Yanez, G., Preciado-Babb, A. P., Brown, B., & Friesen, S. (2021). Emergence in school systems: Lessons from complexity and pedagogical leadership. *Canadian Journal of Educational Administration and Policy/Revue canadienne en administration et politique de l'éducation*, *196*, 65-82.

Alter, C., Haynes, S., & Worland, J. (n.d). *TIME. 2019 person of the year*. https://time.com/person-of-the-year-2019-greta-thunberg/

Amnesty International. (2019). *Ten young activists shaping the world they want*. https://www.amnesty.org/en/latest/campaigns/2019/08/ten-young-activists-shaping-the-world-they-want/

Anderson, A. (2012). Climate change education for mitigation and adaptation. *Journal of Education for Sustainable Development*, *6*(2), 191-206. https://doi.org/10.1177/0973408212475199

Anderson, G., & Arsenault, N. (1998). *Fundamentals of educational research* (2nd ed. ed.). Falmer.

Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: Validation of the student engagement instrument. *Journal of school psychology*, *44*(5), 427-445. https://doi.org/10.1016/j.jsp.2006.04.002

Archie, K. M., Chapman, R., & Flood, S. (2018). Climate change response in New Zealand communities: Local scale adaptation and mitigation planning. *Environmental Development*, *28*, 19-31. https://doi.org/10.1016/j.envdev.2018.09.003

Armstrong, A., Krasny, M., Schuldt, P. (2018). *Comunicating climate change. A guide for educators*. Cornell University Press.

Astor, M. (2019). *How the politically unthinkable can become mainstream*. New York Times. https://www.nytimes.com/2019/02/26/us/politics/overton-window-democrats.html

Attenborough, D. (2020). *A life on our planet: My witness statement and a vision for the future*. Random House.

Ayers, J., Bryant, J., & Missimer, M. (2020). The use of reflective pedagogies in sustainability leadership education-a case study. *Sustainability (Basel, Switzerland)*, *12*(17), 6726. https://doi.org/10.3390/SU12176726

Bagoly-Simó, P. (2013). Tracing sustainability: An international comparison of ESD implementation into lower secondary education. *Journal of Education for Sustainable Development*, *7*(1), 95-112. https://doi.org/10.1177/0973408213495610

Ballard, P. J., Hoyt, L. T., & Pachucki, M. C. (2019). Impacts of adolescent and young adult civic engagement on health and socioeconomic status in adulthood. *Child Development*, *90*(4), 1138-1154. https://doi.org/10.1111/cdev.12998

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215. https://doi.org/10.1037/0033-295X.84.2.191

Bang, M. (2020). Learning on the move toward just, sustainable, and culturally thriving futures. *Cognition and Instruction*, *38*(3), 434-444. https://doi.org/10.1080/07370008.2020.1777999

Barad, K. M., & Alice, F. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Duke University Press. https://doi.org/10.1515/9780822388128

Barbalet, J. M. (1998). *Emotion, Social Theory, and Social Structure: A Macrosociological Approach*. Cambridge University Press. http://ebookcentral.proquest.com/lib/waikato/detail.action?docID=201654

Barni, D., Ranieri, S., Scabini, E., & Rosnati, R. (2011). Value transmission in the family: Do adolescents accept the values their parents want to transmit? *Journal of Moral Education*, *40*(1), 105-121. https://doi.org/10.1080/03057240.2011.553797

Barret, D. (2018, April 20). *The history of student activism in the united states*. https://www.teenvogue.com/story/the-history-of-student-activism-in-the-united-states

Bauld, A. (2021). Why schools need to look at their own carbon footprint. *Usable Knowledge*. https://www.gse.harvard.edu/news/uk/21/11/why-schools-need-look-their-own-carbon-footprint

Beals, F., & Wood, B. (2012). Negotiating agency: Local youth activism in Aotearoa-New Zealand. In F. Beals & B. Wood (Eds.), *Super girls, gangstas, freeters, and xenomaniacs: Gender and modernity in global youth cultures.* (pp. 193-210). Syracuse University Press.

Bell, P., Van Horne, K., & Cheng, B. (2017). Special issue: Designing learning environments for equitable disciplinary identification. *Journal of the Learning Sciences*, *26*(3), 367-375. https://doi.org/10.1080/10508406.2017.1336021

Bennett, H., Jones, R., Keating, G., Woodward, A., Hales, S. & Metcalf, S. (2014). Health and equity impacts of climate change in Aotearoa-New Zealand, and health gains from

climate action. *New Zealand Medical Journal*, *127*. http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2014/vol-127-no-1406/6366

Berman, R. (2021). *Eco-anxiety: 75% of young people say 'the future is frightening'*. Medical News Today. https://www.medicalnewstoday.com/articles/eco-anxiety-75-of-young-people-say-the-future-is-frightening

Berryman, M., & Eley, E. (2018). Gathering and listening to the voices of Māori youth: What are the system responses? In R. Bourke & J. Loveridge (Eds.), *Radical collegiality through student voice: Educational experience, policy and practice* (pp. 103-126). Springer Singapore. https://doi.org/10.1007/978-981-13-1858-0_7

Berryman, M., SooHoo, S., Nevin, A., Arani Barrett, T., Ford, T., Joy Nodelman, D., Valenzuela, N., & Wilson, A. (2013). Culturally responsive methodologies at work in education settings. *International Journal for Researcher Development*, *4*(2), 102-116. https://doi.org/10.1108/IJRD-08-2013-0014

Bhattacharya, S. (2020). Education as empowerment: Review of pedagogy of the oppressed. *Journal of Political Science Education*, *16*(3), 403-406. https://doi.org/10.1080/15512169.2019.1632715

Bieniek-Tobasco, A., McCormick, S., Rimal, R. N., Harrington, C. B., Shafer, M., & Shaikh, H. (2019). Communicating climate change through documentary film: Imagery, emotion, and efficacy. *Climatic Change*. https://doi.org/10.1007/s10584-019-02408-7

Birdsall, S. (2015). The pedagogical realisation of education for sustainability. *Environmental Education Research*, *22*(3), 1-2. https://doi.org/10.1080/13504622.2015.1018140

Bishop, R. (2003). *Culture counts: Changing power relations in education*. Zed Books.

Bishop, R. (2019). *Teaching to the North-East: Relationship-based learning in practice*. NZCER Press.

Blaikie, N. W. H. (2016). *Social research: paradigms in action*. Malden, MA: Polity Press.

Blakemore, E. (2018). Youth in revolt. Five revolutions started by young activists. *National Geographic*. https://www.nationalgeographic.com/news/2018/03/youth-activism-young-protesters-historic-movements/

Bodansky, D. (2001). The history of the global climate change regime. In U. Luterbacher & D. F. Sprinz (Eds.), *International relations and global climate change*. Institute of Technology.

Bogdan, R., & Biklen, S. K. (2007). *Qualitative research for education : an introduction to theory and methods* (5th ed. ed.). Pearson A & B.

Boler, M. (1999). *Feeling power: Emotions and education*. Routledge. https://doi.org/10.4324/9780203009499

Bolstad, R. (2020a). *Climate change and sustainability in secondary schools report* (NZCER, Issue. https://www.nzcer.org.nz/research/publications/climate-change-and-sustainability-secondary-schools-report

Bolstad, R. (2020b). Education and climate change - what can schools do? *New Zealand Principal*, *35*(1), 24-28. https://issuu.com/nzprincipal.co.nz/docs/nzp_t1_2020_web?fr=sN2I4NzE5NzQzNQ

Bolstad, R. (2020c). *Opportunities for education in a changing climate: Themes from key informant interviews*. New Zealand council for educational research. http://dx.doi.org/10.18296/rep.0006

Bolstad, R. (2021a). *Harnessing education's power for positive climate action*. Education International. https://www.ei-ie.org/en/item/25185:harnessing-educations-power-for-positive-climate-action

Bolstad, R. (2021b). *Helping children cope with climate anxiety* [Interview]. https://www.rnz.co.nz/audio/player?audio_id=2018783132

Bolstad, R., Gilbert, J., McDowall, S., Bull, A., Boyd, S., & Hipkins, R. (2012). *Supporting future-oriented learning & teaching: A New Zealand perspective*. Ministry of Education Wellington.

Bolstad, R., Joyce, C., & Hipkins, R. (2015). *Environmental education in New Zealand schools Research update*. Ministry of Education. https://www.educationcounts.govt.nz/publications/curriculum/5775

Boone, H., & Boone, D. (2012). Analyzing Likert data. *Journal of Extension*, *50*(2).

Boronski, T. (2021). *Critical pedagogy: An exploration of contemporary themes and issues*. Taylor and Francis. https://doi.org/10.4324/9781315101811

Botzen, W., Duijndam, S., & van Beukering, P. (2021). Lessons for climate policy from behavioral biases towards COVID-19 and climate change risks. *World Development*, *137*, 105214. https://doi.org/doi.org/10.1016/j.worlddev.2020.105214

Boulianne, S., Lalancette, M., & Ilkiw, D. (2020). "School strike 4 climate": Social media and the international youth protest of climage change. *Media and communication*, *8*(2), 208-218. https://doi.org/http://dx.doi.org/10.17645/mac.v8i2.2768

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*, *9*(2), 27-40. https://doi.org/10.3316/QRJ0902027

Bowman, B. (2019). Imagining future worlds alongside young climate activists: a new framework for research. *Fennia*, *197*(2), 295-305. https://doi.org/10.11143/fennia.85151

Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. Sage Publications.

Braun, V. (2013). *Successful qualitative research: a practical guide for beginners*. London: SAGE.

Braun, V., & Clarke, V. (2021). To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative Research in Sport, Exercise and Health*, *13*(2), 201-216. https://doi.org/10.1080/2159676X.2019.1704846

Braus, J. (2020). Civic and environmental education: Protecting the planet and our democracy. In D. Orr, Gumbel, A, Kitwans, B, Becker, W (Ed.), *Democracy unchained. How to rebuild government for the people*. The New Press.

Bright, R., & Eames, C. (2020). Climate strikes: Their value in engaging and educating secondary school students. *Set: Research Information for Teachers*, *3*, 4-11. https://doi.org/10.18296/set.0180

Bright, R., & Eames, C. (2021). From apathy through anxiety to action: emotions as motivators for youth climate strike leaders. *Australian Journal of Environmental Education*, 1-13. https://doi.org/10.1017/aee.2021.22

Brignall-Theyer, Allen, M., & Taylor, R. (2010). *Education for sustainability in New Zealand schools. An education challenge for New Zealand*. https://www.landcareresearch.co.nz/__data/assets/pdf_file/0003/28263/hatched_ebook_entire_web.pdf

Brocklehurst, H. (2015). Educating Britain? Political literacy and the construction of national history. *JCMS: Journal of Common Market Studies*, *53*(1), 52-70. https://doi.org/10.1111/jcms.12211

Brown, J. H. (2015). The Oxymoron of Sustainable Development. *BioScience*, *65*(10), 1027-1029. https://doi.org/10.1093/biosci/biv117

Burton, D., & Bartlett, S. (2009). *Key issues for education researches*. SAGE.

Busch, K., Henderson, J., & Stevenson, K. (2018). Broadening epistemologies and methodologies in climate change education research. *Environmental Education Research*. https://doi.org/10.1080/13504622.2018.1514588

Campbell-Price, M., & Cosgriff, M. (2017). Dealing with a quandary: Funding outdoor education in Aotearoa New Zealand [Journal Article]. *Te Whakatika*, *35*(Spring), 6-12. https://hdl.handle.net/10289/11522

Carleton, T., & Hsiang, S. (2016). Social and economic impacts of climate. *Science*, *353*(6304), n/a. https://doi.org/10.1126/science.aad9837

Carter, L. (2019a). Aotearoa/New Zealand adaptation strategies and practices. In L. Carter (Ed.), *Indigenous Pacific approaches to climate change: Aotearoa/New Zealand* (pp. 71-84). Springer International Publishing. https://doi.org/10.1007/978-3-319-96439-3_6

Carter, L. (2019b). Aotearoa/New Zealand and the Emissions Trading Scheme. In L. Carter (Ed.), *Indigenous Pacific Approaches to Climate Change: Aotearoa/New Zealand* (pp. 55-69). Springer International Publishing. https://doi.org/10.1007/978-3-319-96439-3_5

Carter, L. (2019c). Traditional Ecological Knowledge in Climate Change. In L. Carter (Ed.), *Indigenous Pacific Approaches to Climate Change: Aotearoa/New Zealand* (pp. 25-38). Springer International Publishing. https://doi.org/10.1007/978-3-319-96439-3_3

Carter, N. (2013). Greening the mainstream: Party politics and the environment. *Environmental Politics*, *22*(1), 73-94. https://doi.org/10.1080/09644016.2013.755391

Casey, A. (2019). My doppelgänger is trying to save the world and you should listen to her. *The Spinoff*. https://thespinoff.co.nz/local-elections/27-09-2019/my-doppelganger-is-trying-to-save-the-world-and-you-should-listen-to-her

Cass, P. (2018). A plan nobody hopes they will need: New Zealand and climate change migration. *Pacific journalism review*, *24*(1), 138-154. https://doi.org/10.24135/pjr.v24i1.426

Chang, C.-H., & Pascua, L. (2017). The state of climate change education – reflections from a selection of studies around the world. *International Research in Geographical and Environmental Education*, *26*(3), 177-179. https://doi.org/10.1080/10382046.2017.1331569

Chapman, D. J. (2011). Environmental education and the politics of curriculum: A national case study. *The Journal of Environmental Education*, *42*(3), 193-202. https://doi.org/10.1080/00958964.2010.526153

Charmaz, K. (1996). The search for meanings - Grounded theory. In J. Smith, L. Harre, & L. Van Langenhove (Eds.), *Rethinking methods in pqychology* (pp. 27-49). Sage publisher.

Charpleix, L. (2018). The Whanganui River as Te Awa Tupua: Place-based law in a legally pluralistic society. *The Geographical Journal*, *184*(1), 19-30.

Chawla, L., & Cushing, D. F. (2007). Education for strategic environmental behavior. *Environmental education research*, *13*(4), 437-452.

Chenail, R. J. (2011). Interviewing the investigator: Strategies for addressing instrumentation and researcher bias concerns in qualitative research. *Qualitative report*, *16*(1), 255.

Christenson, S., Reschly. L & Wylie, C. (2012). *Handbook of research on student engagement* (2012 ed.). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4614-2018-7

Cianconi, P., Betrò, S., & Janiri, L. (2020). The Impact of Climate Change on Mental Health: A Systematic Descriptive Review. *Frontiers in psychiatry*, *11*, 74-74. https://doi.org/10.3389/fpsyt.2020.00074

Cinelli, M., Morales, G. D. F., Galeazzi, A., Quattrociocchi, W., & Starnini, M. (2021). The echo chamber effect on social media. *Proceedings of the National Academy of Sciences*, *118*(9).

Climate Change Commission. (2021). *Annual report*. https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/Corporate-publications/2021-annual-report.pdf

Coe, R., Waring, M., Hedges, L. V., & Ashley, L. D. (2021). *Research methods & methodologies in education* (3rd edition. ed.). SAGE.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed. ed.). Routledge.

Collins, S. (2019). Thousands of Kiwi school students join global 'school strike for climate'. *NZ Herald*. https://www.nzherald.co.nz/nz/thousands-of-kiwi-school-students-join-global-school-strike-for-climate/MYIQ4VAMD2OHQ2UGJZZYTQC5EE/

Cologna V, H. G., Brick C. (2021). To strike or not to strike? an investigation of the determinants of strike participation at the Fridays for Future climate strikes in Switzerland. *PloS ONE*, *16*(10). https://doi.org/10.1371/journal.pone.0257296

Cook-Sather, A. (2018). Tracing the evolution of student voice in educational research. In R. Bourke & J. Loveridge (Eds.), *Radical collegiality through student voice: Educational experience, policy and practice* (pp. 17-38). Springer Singapore. https://doi.org/10.1007/978-981-13-1858-0_2

Cooke, H. (2019). Zero Carbon Bill passes with near-unanimous support, setting climate change targets into law. *Stuff*. https://www.stuff.co.nz/national/politics/117244331/national-will-support-climate-change-zero-carbon-bill

COP26. (2021). *The Glasgow Climate Pact*. https://ukcop26.org/wp-content/uploads/2021/11/COP26-Presidency-Outcomes-The-Climate-Pact.pdf

Counterpoint. (2021). *Green wedge? Mapping dessent against climate policy in Europe*. https://counterpoint.uk.com/wp-content/uploads/2021/03/Green_Wedge_Counterpoint_OSEPI.pdf

Cowie, B., Otrel-Cass, K., & Moreland, J. (2010). Multimodal ways of eliciting students' voice. *Waikato Journal of Education*, *15*(2). https://doi.org/10.15663/wje.v15i2.115

Creeber, G., & Martin, R. (2008). *Digital Cultures: Understanding New Media*. Berkshire: McGraw-Hill Education.

Crone, E. (2017). *The adolescent brain : changes in learning, decision-making and social relations*. Routledge.

Crowther, J., & Shaw, M. (1997). Social Movements and the Education of Desire. *Community Development Journal*, *32*(3), 266-279. http://www.jstor.org/stable/44257347.

Cumming, J. (2021). Going hard and early: Aotearoa New Zealand's response to Covid-19. *Health Economics, Policy and Law*, *17*(1), 107-119. https://doi.org/10.1017/S174413312100013X

Czerwonatis, J. (2019). Climate change: Striking for a better future in Northland. *NZ Herald*. https://www.nzherald.co.nz/northern-advocate/news/climate-change-striking-for-a-better-future-in-northland/L64HZ5E62B4T5IBRRSQ65S3KVI/

Daalder, M. (2021). Why the Government needs you to protest for the climate. *Newsroom*. https://www.newsroom.co.nz/jacinda-ardern-needs-you-to-protest-for-the-climate

Daniels, H. (2016). *Vygotsky and Pedagogy*. Taylor and Francis.

Darder, A., Baltodano, M., & Torres, R. (2003). *Critical pedagogy, an introduction*. Routledge Falmer.

de Moor, J., De Vydt, M., Uba, K., & Wahlström, M. (2020). New kids on the block: taking stock of the recent cycle of climate activism. *Social Movement Studies*, 1-7. https://doi.org/10.1080/14742837.2020.1836617

Deakin, H., & Wakefield, K. (2014). Skype interviewing: reflections of two PhD researchers. *Qualitative Research*, *14*(5), 603-616. https://doi.org/10.1177/1468794113488126

Deguara, B. (2019). Crunching the numbers behind the national climate change strike turnout. *Stuff*. https://www.stuff.co.nz/environment/climate-news/116172915/crunching-the-numbers-behind-the-national-climate-change-strike-turnout

Department of Conservation. (2017). *Environmental Education for Sustainability Strategy and Action Plan*. https://www.doc.govt.nz/about-us/our-policies-and-plans/education-strategies/environmental-education-for-sustainability-strategy-and-action-plan/

Dewey, J. (2008). *Democracy and education*. Dover Publications.

Dewey, J. (2009). *Democracy and education an introduction to the philosophy of education*. The Floating Press.

Dickson, A., Akwasi, Y., & Attah, K. (2016). Constructivism philosophical paradigm: Implication for research, teaching and learning. *Global Journal of Arts Humanities and Social Sciences*, *4*(10), 1-9. https://www.eajournals.org/wp-content/uploads/Constructivism-Philosophical-Paradigm-Implication-for-Research-Teaching-and-Learning.pdf (European Centre for Research Training and Development UK)

Dooley, K., Holz, C., Kartha, S., Klinsky, S., Roberts, J. T., Shue, H., Winkler, H., Athanasiou, T., Caney, S., Cripps, E., Dubash, N. K., Hall, G., Harris, P. G., Lahn, B., Moellendorf, D., Müller, B., Sagar, A., & Singer, P. (2021). Ethical choices behind quantifications of fair contributions under the Paris Agreement. *Nature climate change*, *11*(4), 300-305. https://doi.org/10.1038/s41558-021-01015-8

Dunlop, M. (2019). *Māori seek direct input into govt's climate change policy*. https://www.rnz.co.nz/news/te-manu-korihi/388797/maori-seek-direct-input-into-govt-s-climate-change-policy

Durst, R. K., & Thelin, W. H. (2006). Can we be critical of critical pedagogy? *College composition and communication*, *58*(1), 110-114.

Eames, & Barker, M. (2011). Understanding student learning in environmental education in Aotearoa New Zealand. *Special issue: The "ness" of environmental education*, *27*(1), 186-191.

Eames, C. (2010). *A framework for developing action competence in education for sustainability (EfS)*.

Eames, C. (2017). Climate change education in New Zealand. *Australian curriculum studies association*, *37*, 99-102. (Springer)

Eames, C., Barker, M., & Scarff, C. (2018). Priorities, identity and the environment: Negotiating the early teenage years. *The Journal of Environmental Education*, *49*(3), 189-206. https://doi.org/10.1080/00958964.2017.1415195

Eames, C., Bolstad, R., & Cowie, B. (2004, April 12-16). *An evaluation of the practice of environmental education in New Zealand schools* AERA, San Diego. http://www.nzcer.org.nz/pdfs/12885.pdf

Eames, C., Cowie, B., & Bolstad, R. (2008). An evaluation of characteristics of environmental education practice in New Zealand schools. *Environmental Education Research*, *14*(1), 35-51. https://doi.org/10.1080/13504620701843343

Eames, C., Gurney, L., Everth, T., Morey, C., Bright, R., DePetris, T., Buntting, C., Barker, A., Soanes, A., Havea, E., & Gaze, S. (2021). *Submission to the Climate Change Commission's Draft Advice*. University of Waikato

Eames, C. W., & DePetris, T. (2018). A collaborative community education model: Developing effective school-community partnerships [Journal Article]. *Australian Journal of Environmental Education*, *33*(3), 171-188. https://doi.org/10.1017/aee.2017.26

Eley, E., & Berryman, M. (2018). Leading Transformative Education Reform in New Zealand Schools. *New Zealand journal of educational studies*, *54*(1), 121-137. https://doi.org/10.1007/s40841-018-0122-7

Elliot, M., Fairweather, I., Olsen, W., & Pampaka, M. (2016). Document analysis. In (1 ed.): Oxford University Press.

Enviroschools. (2018). *Enviroschools*. http://www.enviroschools.org.nz/

Ernman, M., Thunberg, G., Ernman, B., & Thunberg, S. (2020). *Our house is on fire: Scenes of a family and a planet in crisis*. Penguin UK.

Ernst, J., & Theimer, S. (2011). Evaluating the effects of environmental education programming on connectedness to nature. *Environmental education research*, *17*(5), 577-598. https://doi.org/10.1080/13504622.2011.565119

Everth, T., & Bright, R. (2022). Climate change and the assemblages of school leaderships. *Australian Journal of Environmental Education*, 1-20. https://doi.org/10.1017/aee.2022.8

Everth, T., Bright, R., Morey, C., dePetris, T., Gaze, S., Barker, A., Soanes, A., L, G., & Eames, C. (2021). Building capacity for climate change education in Aotearoa New Zealand schools. *Set: research information for teachers (Wellington)*(2), 40-45.

Ewing, E. (2017). Jacinda Ardern: 'Climate change is my generation's nuclear-free moment'. *Newshub*. https://www.newshub.co.nz/home/election/2017/08/jacinda-ardern-climate-change-is-my-generation-s-nuclear-free-moment.html

Extinction Rebellion. (2019). *Governments - Where is your plan? Extinction Rebellion*. https://rebellion.earth/

Far North District Council. (2019). *Climate Change*. Retrieved 22 Feb from https://www.fndc.govt.nz/your-council/councils-policies/climate-change

Feldman, R. (2022). Who's striking, and who's not? Avoiding and acknowledging bias in youth climate activism research. *Australian Journal of Environmental Education*, 1-7. https://doi.org/10.1017/aee.2022.2

Fereday, J. (2006). Demonstrating regour using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International journal of qualitative methodology*. http://creativecommons.org/licenses/by/2.0

Finfgeld-Connett, D. (2018). *A guide to qualitative meta-synthesis* (First edition. ed.). Routledge.

Fobes, C., & Kaufman, P. (2008). Critical pedagogy in the sociology classroom: Challenges and concerns. *Teaching sociology*, *36*(1), 26-33. https://doi.org/10.1177/0092055X0803600104

Foran, J., Kurian, P. A., Munshi, D., & Bhavnani, K.-K. (2019). *Climate futures: Re-imagining global climate justice*. London, England : Zed.

Franks, J. (2019). Climate change strike: Up to 80,000 protesters form human chain in Auckland. *Stuff*. https://www.stuff.co.nz/environment/climate-news/116143489/climate-change-strike-up-to-80000-protesters-form-human-chain-in-auckland

Fredricks, J. A., Parr, A. K., Amemiya, J. L., Wang, M.-T., & Brauer, S. (2019). What matters for urban adolescents' engagement and disengagement in school: A mixed-methods study. *Journal of Adolescent Research*, 0743558419830638. https://doi.org/10.1177/0743558419830638

Freire, P. (1985). *The politics of education: Culture, power & liberation*. Greenwood publishing.

Freire, P. (1992). *Pedagogy of hope. Reliving pedagogy of the oppressed*. Continuum. https://books.google.co.nz/books?id=wVXNl2s915cC&lpg=PA1&ots=5y4bvnifA3&dq=freire%20pedagogy%20of%20hope&lr&pg=PP5#v=onepage&q=freire%20pedagogy%20of%20hope&f=false

Freire, P. (2015). *Pedagogy of the oppressed*. Bloomsbury Academic.

Gardner-McTaggart, A. C. (2020). Educational leadership and global crises; reimagining planetary futures through social practice. *International journal of leadership in education*, 1-17. https://doi.org/10.1080/13603124.2020.1811900

Garner, D. (2019). Duncan Garner: Climate strike just a day off school. *Newshub*. https://www.newshub.co.nz/home/new-zealand/2019/03/duncan-garner-climate-strike-just-a-day-off-school.html

Gifford, R. (2011). The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. *American Psychologist*, *66*(4), 290-302. https://doi.org/10.1037/a0023566

Gilbert, J. (2015). Leading in collaborative, complex education systems.

Glasgow, B. (2019). SDG workshop on climate change with young leaders and the Auckland Climate Action Framework. In Ria Bright & Chris Eames (Eds.).

Global Climate Strike. (2019). *Global Climate Strike 20-27 Sept*. 350.org. https://globalclimatestrike.net/

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The qualitative report*, *8*(4), 596-606. https://nsuworks.nova.edu/tqr/vol8/iss4/6

Goodall, L. (2019). Climate change scientists look to Māori and other indigenous people for answers. *Stuff*. https://www.stuff.co.nz/environment/climate-news/110587713/climate-change-scientists-look-to-maori-and-other-indigenous-people-for-answers

Goodman, B. (2014). Paulo Friere and the pedogogy of the oppressed. *Nurse Education Today*, *34*(7), 1055-1056. https://doi.org/10.1016/j.nedt.2014.03.018

Gordon, H. R. (2010). *We fight to win: inequality and the politics of youth activism*. New Brunswick, N.J: Rutgers University Press.

Gordon, H. R., & Bluebond-Langner, M. (2009). *We fight to win : Inequality and the politics of youth activism*. Rutgers University Press. http://ebookcentral.proquest.com/lib/waikato/detail.action?docID=980034

Gough, A. (2015). A long, winding (and rocky) road to environmental education for sustainability in 2006. *Australian Journal of Environmental Education*, *22*(1), 71-76. https://doi.org/10.1017/S0814062600001671

Graham, A., Powell, M. A., & Taylor, N. (2015). Ethical research involving children: Encouraging reflexive engagement in research with children and young people. *Children & society*, *29*(5), 331-343. https://doi.org/10.1111/chso.12089

Graham, J. A. (2019). *Incidental teacher/student moments in an Aotearoa New Zealand secondary school: Entangled encounters with key competencies* [Doctoral, The University of Waikato]. Hamilton, New Zealand. https://hdl.handle.net/10289/12737

Gray, L. M., Wong-Wylie, G., Rempel, G. R., & Cook, K. (2020). Expanding qualitative research interviewing strategies: Zoom video communications. *The Qualitative Report*, *25*(5), 1292-1301.

Grix, J. (2002). Introducing students to the generic terminology of social research. *Politics*, *22*(3), 175-186. (Political studies association)

Guba, E., & Lincoln, Y. (1994). Competing paradigms in qualitative research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). Sage Publications.

Haltinner, K., & Sarathchandra, D. (2018). Climate change skepticism as a psychological coping strategy. *Sociology compass*, *12*(6), e12586-n/a. https://doi.org/10.1111/soc4.12586

Haque, B. (2014). *Changing our secondary schools*. NZCER Press.

Haque, B. (2017). *New Zealand secondary schools & your child: A guide for parents*. David Bateman.

Harker, J., Taylor, P., & Knight-Lenihan, S. (2017). Multi-level governance and climate change mitigation in New Zealand: lost opportunities. *Climate Policy*, *17*(4), 485-500. https://doi.org/10.1080/14693062.2015.1122567

Harmon-Jones, E., & Harmon-Jones, C. (2019). Understanding the motivation underlying dissonance effects.

The action-based model. In E. Harmon-Jones (Ed.), *Cognitive Dissonance* (2 ed., pp. 63-90). American Psychological Association. http://www.jstor.org.ezproxy.waikato.ac.nz/stable/j.ctv1chs6tk.10

Harrē, N. (2020). *The psychology of sustainability*. The University of Auckland. https://www.auckland.ac.nz/en/news/2020/11/25/the-psychology-of-sustainability.html

Harring, N., Jagers, S. C., & Löfgren, Å. (2021). COVID-19: Large-scale collective action, government intervention, and the importance of trust. *World Development*, *138*, 105236. https://doi.org/https://doi.org/10.1016/j.worlddev.2020.105236

Hartas, D. (2010). *Educational research and inquiry. Qualitative and quantitative approaches*. Continuum International Publishing Group.

Haslett, S., France, D., & Gedye, S. (2011). *Pedagogy of climate change: An introduction*. ResearchGate. https://www.researchgate.net/publication/259889872_Pedagogy_of_Climate_Change_an_Introduction

Havik, T., & Westergård, E. (2020). Do Teachers Matter? Students' Perceptions of Classroom Interactions and Student Engagement. *Scandinavian Journal of Educational Research, 64*(4), 488-507. https://doi.org/10.1080/00313831.2019.1577754

Hayes, D. (2010). The seductive charms of a cross-curricular approach. *Education 3-13*, *38*(4), 381-387. https://doi.org/10.1080/03004270903519238

Hayward, B. (2021). *Children, citizenship and environment : #schoolstrike edition* (Second edition. ed.). Routledge, Taylor & Francis Group.

Hayward, B., Salili, D. H., Tupuana'i, L. L., & Tualamali'i, J. (2020). It's not "too late": Learning from Pacific Small Island Developing States in a warming world. *Wiley interdisciplinary reviews. Climate change*, *11*(1), n/a. https://doi.org/10.1002/wcc.612

He Pou a Rangi Climate Change Commission. (2021a). https://www.climatecommission.govt.nz/

He Pou a Rangi Climate Change Commission. (2021b). *2021 draft advice for consultation*. https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/evidence/advice-report-DRAFT-1ST-FEB/ADVICE/CCC-ADVICE-TO-GOVT-31-JAN-2021-pdf.pdf

Heffron, J. M. (2022). Soka education and the land ethic: educational leadership toward the 'creative co-existence of nature and humanity'[1]. *Environmental Education Research*, 1-15.

Held, D. (1980). *Introduction to critical theory. Hockheimer to Habermas*. Universtiy of California Press.

Herranen, J., Kousa, P., Fooladi, E., & Aksela, M. (2019). Inquiry as a context-based practice - a case study of pre-service teachers' beliefs and implementation of inquiry in context-based science teaching. *International journal of science education*, *41*(14), 1977-1998. https://doi.org/10.1080/09500693.2019.1655679

Hickman, C. (2020). We need to (find a way to) talk about ... Eco-anxiety. *Journal of social work practice*, *34*(4), 411-424. https://doi.org/10.1080/02650533.2020.1844166

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. *The Lancet Planetary Health*, *5*(12), e863-e873.

Hochachka, G. (2020). Unearthing insights for climate change response in the midst of the COVID-19 pandemic. *Global Sustainability*, *3*, e33, Article e33. https://doi.org/10.1017/sus.2020.27

Hopkins, D., Campbell-Hunt, C., Carter, L., Higham, J. E. S., & Rosin, C. (2015a). Climate change and Aotearoa New Zealand. *WIREs Climate Change*, *6*(6), 559-583. https://doi.org/https://doi.org/10.1002/wcc.355

Hopkins, D., Campbell-Hunt, C., Carter, L., Higham, J. E. S., & Rosin, C. (2015b). Climate change and Aotearoa New Zealand. In (Vol. 6, pp. 559-583). Hoboken, USA.

Hosking, M. (2019). Mike Hosking: Kids' climate protest nothing but hot air. *NZ Herald*. https://www.nzherald.co.nz/nz/mike-hosking-kids-climate-protest-nothing-but-hot-air/DZW3JPTBMF3AY7L2EMPYQXDJBE/

Hostetler, K. (2005). What is 'good' educational research. *Educational Researcher*, *34*(6), 16-21.

Howell, K. (2016). Paradigm of inquiry: Critical theory and constructivism. In (pp. 29-46). London: Palgrave Macmillan UK.

Howell, R., & Allen, S. (2019). Significant life experiences, motivations and values of climate change educators. *Environmental Education Research*, *26*(6), 813-831. https://doi.org/10.1080/13504622.2016.1158242

Howie, P., & Bagnall, R. G. (2013). A beautiful metaphor: Transformative learning theory. *International journal of lifelong education*, *32*(6), 816-836. https://doi.org/10.1080/02601370.2013.817486

Hutt, K. (2019). School Strike 4 Climate: Young people to march again in April. *Stuff*. https://www.stuff.co.nz/environment/climate-news/124684929/school-strike-4-climate-young-people-to-march-again-in-april

Ignell, C., Davies, P., & Lundholm, C. (2019). A longitudinal study of upper secondary school students' values and beliefs regarding policy responses to climate change. *Environmental Education Research*, *25*(5), 615-632. https://doi.org/10.1080/13504622.2018.1523369

Ilisko, D. (2018). Dealing with climate change as a wicked issue via innovative approaches. In U. Azeiteiro (Ed.), *Climate literacy and innovations in climate change education*. Springer.

Interim Climate Change Committee. (2019). *New Zealand joins a global effort to address climate change by adopting progressively more ambitious national targets.* https://ndhadeliver.natlib.govt.nz/webarchive/20190819081021/https://www.iccc.mfe.govt.nz/

IPBES. (2019). *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.* https://doi.org/10.5281/zenodo.3831673

IPCC. (2014). *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC, 2014, Issue.

IPCC. (2018). *Climate change impacts studies database*. Intergovernmental panel on climate change. https://www.ipcc.ch/

IPCC. (2022a). *Climate change 2022: Impacts, adaptation and vulnerability. working group II contribution to the IPCC sixth assessment report*. https://www.ipcc.ch/report/ar6/wg2/about/factsheets

IPCC. (2022b). *History of IPCC*. https://www.ipcc.ch/about/history/

IPPC. (2019). *Summary for policy makers*. https://www.ipcc.ch/site/assets/uploads/sites/4/2019/12/02_Summary-for-Policymakers_SPM.pdf

Irwin, R. (2020). Climate change and education. *Educational Philosophy and Theory*, *52*(5), 492-507. https://doi.org/10.1080/00131857.2019.1642196

Jackson, P. (n.d). *From Stockholm to Kyoto: A Brief History of Climate Change*. United Nations. https://www.un.org/en/chronicle/article/stockholm-kyoto-brief-history-climate-change

Jacobs, M. (2022). AgResearch embraces mātauranga Māori, creates new department to support it. *Stuff*. https://www.stuff.co.nz/pou-tiaki/300591606/agresearch-embraces-mtauranga-mori-creates-new-department-to-support-it

Jason, Z. (2018). *Student activism 2.0*. https://www.gse.harvard.edu/news/ed/18/08/student-activism-20

Jensen, B. B., & Schnack, K. (2006). The action competence approach in environmental education. *Environmental Education Research*, *12*(3-4), 471-486. https://doi.org/10.1080/13504620600943053

Jickling, B., & Wals, A. E. J. (2008). Globalization and environmental education: Looking beyond sustainable development. *Journal of Curriculum Studies*, *40*(1), 1-21. https://doi.org/10.1080/00220270701684667

Jones, C. A., & Davison, A. (2021). Disempowering emotions: The role of educational experiences in social responses to climate change. *Geoforum*, *118*, 190-200. https://doi.org/10.1016/j.geoforum.2020.11.006

Joy, R. (2021). *COP 26: Setting a benchmark for success*. Bristol University Press. https://www.transformingsociety.co.uk/2021/10/20/cop26-setting-a-benchmark-for-success/

Jucker, R. M., R,. (2015). *Concepts, policies and educational experiences at the end of the UN decade of education for sustainable development*. Springer.

Jung, J., Petkanic, P., Nan, D., & Kim, J. H. (2020). When a Girl Awakened the World: A User and Social Message Analysis of Greta Thunberg. *Sustainability*, *12*(7), 2707. https://www.mdpi.com/2071-1050/12/7/2707

Ka'ai-Mahuta, R. (2011). The impact of colonisation on te reo Māori: A critical review of the State education system. *Te Kaharoa*, *4*(1). https://doi.org/10.24135/tekaharoa.v4i1.117

Kane, R. G., & Maw, N. (2005). Making sense of learning at secondary school: involving students to improve teaching practice. *Cambridge Journal of Education*, *35*(3), 311-322. https://doi.org/10.1080/03057640500319024

Kasza, P., & Slater, T. (2017). A survey of best practices and key learning objectives for successful secondary school STEM academy settings. *Contemporary Issues in Education Research*, *10*(1), 53-66. https://doi.org/10.19030/cier,v10il.9880

Kawharu, M. (2000). Kaitiakitanga: a Maori anthropological perspective of the Maori socio-environmental ethic of resource management. *The Journal of the Polynesian Society*, *109*(4), 349-370.

Kay, N., McDowell, E., & Phipps, N. (2021). *High tide don't hide* The rebel film collective. https://hightide-donthide.com/

Kenis, A. (2021). Kenis, A. (2021). Clashing tactics, clashing generations : the politics of the school strikes for climate in Belgium. *POLITICS AND GOVERNANCE*, *9*(2), 135-145. https://doi.org/10.17645/pag.v9i2.3869

Ketchell, M. (2019). *Greta Thunberg's radical climate change fairy tale is exactly the story we need*. Candian Press. https://theconversation.com/greta-thunbergs-radical-climate-change-fairy-tale-is-exactly-the-story-we-need-124252

Khalil, A., & Cowie, B. (2020). A research note: Videoconferencing interviews. *Waikato Journal of Education*, *25*(1), 101-107.

Khan, M., Robinson, S.-a., Weikmans, R., Ciplet, D., & Roberts, J. T. (2020). Twenty-five years of adaptation finance through a climate justice lens. *Climatic Change*, *161*(2), 251-269. https://doi.org/10.1007/s10584-019-02563-x

Kleres, J., & Wettergren, Å. (2017). Fear, hope, anger, and guilt in climate activism. *Social Movement Studies*, *16*(5), 507-519. https://doi.org/10.1080/14742837.2017.1344546

Knox, H. (2015). Thinking like a climate. *Scandinavian Journal of Social Theory*, *16*(1), 91-109. https://doi.org/10.1080/1600910X.2015.1022565

Kokkos, A. (2019). Introducing the method transformation theory in educational practice. In *European Perspectives on Transformation Theory* (pp. 129-144). Springer International Publishing. https://doi.org/10.1007/978-3-030-19159-7_9

Kollmuss, A., Zink, H., & Polycarp, C. (2008). *Making sense of the voluntary carbon market a comparison of carbon offset standards*. WWF. https://www.globalcarbonproject.org/global/pdf/WWF_2008_A%20comparison%20of%20C%20offset%20Standards.pdf

Kopnina, H. (2020). Education for sustainable development goals (ESDG): What is wrong with ESDGs, and what can we do better? *Education Sciences*, *10*(10), 261. https://www.mdpi.com/2227-7102/10/10/261

Kopnina, H., & Washington, H. (2019). *Conservation: Integrating Social and Ecological Justice*. Cham: Springer International Publishing AG.

Korsant, C. (2022). A Freirean ecopedagogy or an imposition of values? The pluriverse and the politics of environmental education. *Globalizations*, 1-18.

Kowalski, K. (2019). *Climate change poses mental health risks to children and teens*. https://www.sciencenewsforstudents.org/article/climate-change-poses-mental-health-risks-children-and-teens

Kunkle, K. A., & Monroe, M. C. (2018). Cultural cognition and climate change education in the U.S.: why consensus is not enough. *Environmental Education Research*, 1-23. https://doi.org/10.1080/13504622.2018.1465893

Kvale, S. (1996). *Interviews: an introduction to qualitative research interviewing*. Thousand Oaks, Calif. : Sage Publications.

Kwauk, C. (2020). *Roadblocks to quality education in a time of climate chnge.* ERIC. https://eric.ed.gov/?id=ED607008

Labour. (n.d.). *Real action on climate change*. https://www.labour.org.nz/climatechange

Lange, E. (2017). Transformative sustainability education: From sustainababble to a civilization leap. In M. Milana, Webb, S., Holford, J., Waller, R., and Jarvis, P., (Eds.) (Ed.), *International handbook on adult and lifelong education and learning*. Palgrave Macmillan.

Lankenau, G. R. (2018). Fostering connectedness to nature in higher education. *Environmental education research*, *24*(2), 230-244. https://doi.org/10.1080/13504622.2016.1225674

Lawrence, J., Sullivan, F., Lash, A., Ide, G., Cameron, C., & McGlinchey, L. (2015). Adapting to changing climate risk by local government in New Zealand: institutional practice barriers and enablers. *Local Environment*, *20*(3), 298-320. https://doi.org/10.1080/13549839.2013.839643

Lawson, D. F., Stevenson, K. T., Peterson, M. N., Carrier, S. J., Seekamp, E., & Strnad, R. (2019). Evaluating climate change behaviors and concern in the family context. *Environmental Education Research*, 1-13. https://doi.org/10.1080/13504622.2018.1564248

Lee, K., Gjersoe, N., O'Neill, S., & Barnett, J. (2020). Youth perceptions of climate change: A narrative synthesis. *WIREs Climate Change*, *11*(3), e641. https://doi.org/10.1002/wcc.641

Leichenko, R., & O'Brien, K. (2020). Teaching climate change in the Anthropocene: An integrative approach. *Anthropocene*, *30*, 100241. https://doi.org/https://doi.org/10.1016/j.ancene.2020.100241

Leicht, A., Heiss, J., & Won Yung, B. (2018). *Issues and trends in education for sustainable development*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000261445

Lejano, R. P., & Nero, S. J. (2020). *The power of narrative: Climate skepticism and the deconstruction of science*. Oxford University Press, USA.

LGNZ. (n.d.). *Climate change project. Actions to adapt to climate change impacts and reduce emissions.* https://www.lgnz.co.nz/climate-change-project/supporting-documents/lgnz-climate-change-symposium-2018/

Li, C. J., & Monroe, M. C. (2019). Exploring the essential psychological factors in fostering hope concerning climate change. *Environmental Education Research*, *25*(6), 936-954. https://doi.org/10.1080/13504622.2017.1367916

Lincoln, Y., & Guba, E. (2016). *The constructivist credo*. Routledge. https://doi.org/10.4324/9781315418810

Lincoln, Y., Lynham, A., & Guba, E. (2011). Pragmatic controversies, contradictions and emerging confluences. In N. Denzin & Y. Lincoln (Eds.), *Qualitative Research*. Sage.

Lotz-Sisitka, H., Wals, A. E. J., Kronlid, D., & McGarry, D. (2015). Transformative, transgressive social learning: rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability*, *16*, 73-80. https://doi.org/https://doi.org/10.1016/j.cosust.2015.07.018

Lurgio, J. (2019). *Saving the Whanganui: can personhood rescue a river?* The Guardian News. https://www.theguardian.com/world/2019/nov/30/saving-the-whanganui-can-personhood-rescue-a-river

Ma, Y., Dixon, G., & Hmielowski, J. D. (2019). Psychological reactance from reading basic facts on climate change: The role of prior views and political identification. *Environmental Communication*, *13*(1), 71-86. https://doi.org/10.1080/17524032.2018.1548369

MacDonald, M. (2016). *Elwyn Richardson: And the early world of creative education in New Zealand*. NZCER Press, New Zealand Council for Educational Research.

MacManus, J. (2021). Why the leaders of School Strike 4 Climate had to move on. *Stuff*. https://www.stuff.co.nz/environment/climate-news/124446610/why-the-leaders-of-school-strike-4-climate-had-to-move-on

MacManus, J., & Daly, M. (2019). *Several mayors 'unsure' whether human activities contribute to climate change*. Stuff. https://www.stuff.co.nz/national/111063926/several-mayors-unsure-whether-human-activities-contribute-to-climate-change

Macy, J., & Johnstone, C. (2012). *Active hope*. New World Library.

Maguire, M., & Delahunt, B. (2017). Doing thematic analysis: A practical step by step guide for learning and teaching scholars. *AISHE*, *8*(3). http://ojs.aishe.org/index.php/aishe-j/article/view/335

Mallon, K., Hamilton, E., Black, M., Beem, B., & Abs, J. (2013). *Adapting the community sector for climate extremes: Extreme weather, climate change & the community sector – Risks and adaptations*.

Mansfield, K. (2014). How listening to student voices informs and strengthens social justice research and practice. *Educational Administration Quarterly*, *50*(3), 392-430. https://doi.org/10.1177/0013161X13505288

Markowitz, D., Laha, R., Perone, V., Pea, R., & Bailenson, J. (2018). Immersive virtual reality field trips facilitate learning about climate change. *Frontiers in Psychology*, *9*. https://doi.org/10.3389/fpsyg.2018.02364

Marris, E. (2019). *Why young climate activist have captured the world's attention* file:///C:/Users/riabr/Desktop/EdD/WAIKATO/News%20about%20strikes/2019%20sept%20Why%20young%20climate%20activists%20have%20captured%20the%20world's%20attention.html#content

May, T. (2011). *Social research issues, methods and process* (4th ed. ed.). McGraw Hill.

McCulloch, G. (2004). *Documentary research in education, history, and the social sciences*. Routledge Falmer.

McElwee, P., Turnout, E., Chiroleu-Assouline, M., Clapp, J., Isenhour, C., Jackson, T., Kelemen, E., Miller, D. C., Rusch, G., Spangenberg, J. H., Waldron, A., Baumgartner, R. J., Bleys, B., Howard, M. W., Mungatana, E., Ngo, H., Ring, I., & Santos, R. (2020). Ensuring a Post-COVID Economic Agenda Tackles Global Biodiversity Loss. *One Earth*, *3*(4), 448-461. https://doi.org/https://doi.org/10.1016/j.oneear.2020.09.011

McGrath, M. (2021). *Climate change: IPCC report is 'code red for humanity'*. https://www.bbc.com/news/science-environment-58130705

McKay, D. J. (2014). *Learning for survival, resilience, well-being and continuance: An epistemology and pedagogy for environmental education/education for sustainability informed by Māori culture* [Doctoral thesis, University of Otago]. OUR Archive. http://hdl.handle.net/10523/4947

McKenzie, P. (2021). Auckland chapter of New Zealand's school strike 4 climate group admits racism and disbands. *The Guardian*. https://www.theguardian.com/world/2021/jun/15/auckland-chapter-of-new-zealands-school-strike-4-climate-group-admits-racism-and-disbands

McMeeking, S., Kahi, H., & Kururangi, G. (2019). He Ara Waiora: background paper on the development and content of He Ara Waiora.

McNamara, K. E. (2013). Raising awareness about climate change in Pacific communities. *Environmental Education Research*, *19*(6), 864-871. https://doi.org/10.1080/13504622.2013.769046

McPhail, G. J. (2016). From aspirations to practice: curriculum challenges for a new 'twenty-first-century' secondary school. *The Curriculum Journal*, *27*(4), 518-537. https://doi.org/10.1080/09585176.2016.1159593

Mechler, R., Singh, C., Ebi, K., Djalante, R., Thomas, A., James, R., Tschakert, P., Wewerinke-Singh, M., Schinko, T., Ley, D., Nalau, J., Bouwer, L. M., Huggel, C., Huq, S., Linnerooth-Bayer, J., Surminski, S., Pinho, P., Jones, R., Boyd, E., & Revi, A. (2020). Loss and damage and limits to adaptation: recent IPCC insights and implications for climate science and policy. *Sustainability Science*, *15*(4), 1245-1251. https://doi.org/10.1007/s11625-020-00807-9

Meyer, L., Penetito, W., Hynds, A., Savage, C., Hindle, R., & Sleeter, C. (2021). *Summary of the Evaluation of Te Kotahitanga: 2004-2008* https://www.educationcounts.govt.nz/publications/91416/english-medium-education/01.-overview

Mezirow, J. (2012). Learning to think like and adult. Core concepts of transformation theory. In E. Taylor & P. Cranton (Eds.), *The Handbook of Transformative Learning : Theory, Research, and Practice*. John Wiley & Sons, Incorporated.

Miller, D. (2001). *Principles of social justice*. harvard university Press.

Miller, T., Birch, M., Mauthner, M., & Jessop, J. (2012). Ethics in Qualitative Research. In (2 ed.). SAGE Publications Ltd. https://doi.org/10.4135/9781473913912

Ministry for Primary Industries. (2017). *Growing and protecting New Zealand*. Ministry for primary industries.

Ministry for Primary Industries. (2019). *Climate change and the primary industries*. Ministry for Primary Industries. https://www.mpi.govt.nz/protection-and-response/environment-and-natural-resources/climate-change-and-the-primary-industries/

Ministry for the Environment. (2018). *New zealand and the united nations framework convention on climate change*. http://www.mfe.govt.nz/climate-change/why-climate-change-matters/global-response/new-zealand-and-united-nations-framework

Ministry for the Environment. (2019). *Arotakenga Huringa Āhuarangi: A Framework for the National Climate Change Risk Assessment for Aotearoa New*

Zealand. https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/arotakenga-huringa-ahuarangi-framework-for-national-climate-change-risk-assessment-for-aotearoa-FINAL.pdf

Ministry for the Environment. (2021a). *Climate Change Response (Zero Carbon) Amendment Act 2019*. https://www.legislation.govt.nz/act/public/2019/0061/latest/LMS183736.html

Ministry for the Environment. (2021b). *Go back to "New Zealand's Greenhouse Gas Inventory 1990-2019 Snapshot*. https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2019-snapshot/how-new-zealand-compares-to-other-countries/

Ministry for the Environment. (2021c). *Te hau mārohi ki anamata. Towards a productive, sustainable and inclusive economy: Aotearoa New Zealand's first emissions reduction plan*. https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/

Ministry for the Environment. (2022a). *Emissions reduction plan*. https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan/

Ministry for the Environment. (2022b). National adaptation plan. https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/national-adaptation-plan/

Ministry for the Environment. (2022c). *Urutau, ka taurikura: Kia tū pakari a Aotearoa i ngā huringa āhuarangi. Adapt and thrive: Building a climate-resilient New Zealand*. https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf

Ministry of Education. (2007a). *Action competence learning process*. https://health.tki.org.nz/Key-collections/Curriculum-in-action/Making-Meaning/Teaching-and-learning-approaches/Action-competence-learning-process

Ministry of Education. (2007b, 08 Dec 2017). *The New Zealand Curriculum*. http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum#collapsible3

Ministry of Education. (2012). *Future focus*. http://nzcurriculum.tki.org.nz/Principles/Future-focus

Ministry of Education. (2015a). *Education for sustainability*. http://nzcurriculum.tki.org.nz/Curriculum-resources/Education-for-sustainability/EfS-in-schools

Ministry of Education. (2015b). *Effective pedagogy for all students*. TKI. https://nzcurriculum.tki.org.nz/Inclusive-practices/Implementing-an-inclusive-curriculum/Effective-pedagogy-for-all-students

Ministry of Education. (2015c). *Guidelines for environmental education*. Ministry of education. http://nzcurriculum.tki.org.nz/Curriculum-resources/Education-for-sustainability/Tools-and-resources/Guidelines-for-Environmental-Education-in-New-Zealand-Schools

Ministry of Education. (2018). *Education Counts*. https://www.educationcounts.govt.nz/statistics/schooling/number-of-schools

Ministry of Education. (2021a). *Evaluation of Te Kōtahitanga Phase 5 (2010-2012)*. https://www.educationcounts.govt.nz/publications/schooling2/workforce/9977/evaluation-of-te-kotahitanga-phase-5

Ministry of Education. (2021b). *The New Zealand curriculum refresh. Draft for consultation*. Retrieved from file:///C:/Users/brigh/Downloads/The%20New%20Zealand%20Curriculum%20Refresh%20%E2%80%93%20Social%20Sciences%20DRAFT.pdf

Ministry of Education. (2021c). *Refreshing our national curriculum*. https://www.education.govt.nz/our-work/changes-in-education/curriculum-and-assessment-changes/curriculum-refresh/

Ministry of Education. (2021d). *School deciles*. https://www.education.govt.nz/school/funding-and-financials/resourcing/operational-funding/school-decile-ratings/

Ministry of Education. (2021e). *Sustainable Contestable Fund*. New Zealand Government. https://www.education.govt.nz/school/funding-and-financials/funding/sustainability-contestable-fund/

Ministry of Education. (2022a). *The Education and Training Act 2020: Te Tiriti o Waitangi*. https://www.education.govt.nz/our-work/legislation/education-and-training-act-2020/the-education-and-training-act-te-tiriti-o-waitangi/

Ministry of Education. (2022b). *Educational leaders*. https://www.educationalleaders.govt.nz/Leadership-development

Mizen, P. (2015). The madness that is the world: Young activist's emotional reasoning and their participation in a local occupy movement. https://publications.aston.ac.uk/id/eprint/26199/1/Madness_That_Is_The_World_Final_Pure.pdf

Mochizuki, Y., & Bryan, A. (2015). Climate change education in the context of education for sustainable development: Rationale and principles. *Journal of Education for Sustainable Development*, *9*(1), 4-26. https://doi.org/10.1177/0973408215569109

Moir, J. (2015). *Agriculture left out of nz government review of emissions trading scheme*. Stuff. Retrieved Nov 25 from https://www.stuff.co.nz/business/farming/74381541/null

Momtaz, S. (2016). *Experiencing climate change in Bangladesh : vulnerability and adaptation in Coastal regions*. London, England : Academic Press.

Monroe, M., Plate, R., Poxarart, A., Bowers, A., & Chaves, W. (2019). Identifying effective climate change education strategies: a systematic review of the research. *Environmental Education Research*, *25*(6), 791-812. https://doi.org/1-22. doi:10.1080/13504622.2017.1360842

Morrison, S. (2022). Te Aroha ki a Papatūānuku Love for our World - Public hui on climate change.

Morrow, F. (2016). Review of The Interregnum: Rethinking New Zealand edited by Morgan Godfery. In (Vol. 31, pp. 125-133). Hamilton.

Mortari, L. (2015). Reflectivity in research practice: An overview of different perspectives. *International Journal of Qualitative Methods*, *14*(5), 1609406915618045. https://doi.org/10.1177/1609406915618045

Morton, J. (2019). 'Show us how it's done' - 22 leading NZ academics who back the School Strike 4 Climate. *NZ Herald*. https://www.nzherald.co.nz/nz/show-us-how-its-done-22-leading-nz-academics-who-back-the-school-strike-4-climate/LRSI4IQ4ACQNNOH6R4HHCMFMVQ/

Mountford, H., Waskow, D., Gonzalez, L., Gajjar, C., Cogswell, N., Holt, M., Fransen, T., Bergen, M., & Gerholdt, R. (2021). *COP26: Key Outcomes From the UN Climate Talks in Glasgow*. World Resources Institute. https://www.wri.org/insights/cop26-key-outcomes-un-climate-talks-glasgow

Murphy, P. D. (2021). Speaking for the youth, speaking for the planet: Greta Thunberg and the representational politics of eco-celebrity. *Popular Communication*, *19*(3), 193-206. https://doi.org/10.1080/15405702.2021.1913493

Mutch, C. (2013). *Doing educational research : a practitioner's guide to getting started* (Second edition. ed.). NZCER Press.

Myllylahti, M., & Treadwell, G. (2020). *Trust in news in New Zealand* https://horizonpoll.co.nz/attachments/docs/nz-trust-in-news-final-report-jmad-april-2020.pdf

Nachmany, M., & Setzer, J. (2018). Policy brief global trends in climate change legislation and litigation: 2018 snapshot. *Grantham Research Institute on Climate Change and the Environment*.

Nairn, K. (2019). Learning from young people engaged in climate activism. The potential of collectivizing despair and hope. *Sage publications*, *27*(5), 435-450. https://doi.org/10.1177/1103308818817603

Nash, R. (1990). Bourdieu on education and social and cultural reproduction. *British journal of sociology of education*, *11*(4), 431-447.

Nässén, N. (2021). *Greta Thungerg and the generation of moral authority* Lund University]. LUP Student Papers. Sweden. https://lup.lub.lu.se/student-papers/search/publication/9043982

NBC News. (2019). *Read Greta Thunberg's full speech at the United Nations Climate Action Summit* https://www.nbcnews.com/news/world/read-greta-thunberg-s-full-speech-united-nations-climate-action-n1057861

Nelson, E. (2015). Student voice as regimes of truth: Troubling authenticity. *Middle Grades Review*, *1*(2). https://scholarworks.uvm.edu/mgreview/vol1/iss2/3/

Nelson, E. (2017). Re-thinking power in student voice as games of truth: dealing/playing your hand. *Pedagogy, Culture & Society*, *25*(2), 181-194. https://doi.org/10.1080/14681366.2016.1238839

New Zealand Government. (2022). *Towards a productive, sustainable and inclusive economy*. Ministry for the Environment. https://mail.google.com/mail/u/0/#inbox/FMfcgzGpFzsrZwPRWVFdszpFhVCcDWxG?projector=1&messagePartId=0.1

New Zealand Parliament. (2017). *Innovative bill protects Whanganui River with legal personhood*. https://www.parliament.nz/en/get-involved/features/innovative-bill-protects-whanganui-river-with-legal-personhood/

New Zealand Statistics. (2018). *New Zealand social indicators*. http://archive.stats.govt.nz/browse_for_stats/snapshots-of-nz/nz-social-indicators/Home/Education/18-year-olds-with-higher-qualif.aspx

Ng, C. (2018). *Empowering engagement: Creating learning opportunities for students from challenging backgrounds*. Cham, Switzerland : Springer.

NIWA. (2019). *Environment report a clear picture of change: NIWA*. NIWA. Retrieved 18 April from https://www.niwa.co.nz/news/environment-report-a-clear-picture-of-change-niwa

Noronha, G. C. (2013). Climate Change Crisis: Lost in Translation. *TerraGreen*, *6*(3), 26.

Northland Regional Council. (2022). *Te Tai Tokerau climate adaptation strategy*. https://catt.org.nz/wp-content/uploads/2022/04/Te-Tai-Tokerau-Climate-Adaptation-Strategy-Final-Version-05-4-2022.pdf

Northland Regional Council. (n.d). *Society*. NRC. https://www.nrc.govt.nz/resource-library-archive/environmental-monitoring-archive2/state-of-the-environment-report-archive/2011/state-of-the-environment-monitoring/our-people/society/

Novlan, J. F. (1998). New Zealand's past and tomorrow's schools: Reasons, reforms and results. *School Leadership & Management*, *18*(1), 7-18.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International journal of qualitative methods*, *16*(1), 1-13. https://doi.org/10.1177/1609406917733847

Nuñez, A. J. (2018). Mother Earth and climate justice indigenous peoples' perspectives of an alternative development paradigm. In T. Jafry, M. Mikulewicz, & K. Helwig (Eds.), *Routledge Handbook of Climate Justice*. Routledge. https://doi-org.ezproxy.waikato.ac.nz/10.4324/9781315537689

NZ Herald. (2019a). Politicians have mixed views on students' climate change protest. *NZ Herald*. https://www.nzherald.co.nz/nz/politicians-have-mixed-views-on-students-climate-change-protest/TYN4C27I4PW6T3V2Y3UU5RILBI/

NZ Herald. (2019b). School strike for climate: Young people out in force across NZ. *NZ Herald*. https://www.nzherald.co.nz/nz/school-strike-for-climate-young-people-out-in-force-across-nz/QZXUW2R4AA2RUKHHRPTYDPDHDI/

NZ Herald. (2019c). Thousands of students march in Wellington for urgent climate change action. *NZ Herald*. https://www.nzherald.co.nz/nz/thousands-of-students-march-in-wellington-for-urgent-climate-change-action/F462WBLHDMJKMJ5LTWSTJN2FVQ/

O'Brien, K., Selboe, E., & Hayward, B. M. (2018). Exploring youth activism on climate change dutiful, disruptive, and dangerous dissent. *Ecology and Society*, *23*(3). https://www.jstor.org/stable/26799169

O'Connor, B., & Harvey, S. (2019). 'Mind-blowing': How climate change strikes united. *Newshub*. https://www.newshub.co.nz/home/new-zealand/2019/09/mind-blowing-how-climate-change-strikes-united-generations-of-kiwis.html

O'Keeffe, C. (2021, April 19). Climate in crisis conversations. In *Turning eco-anxiety into eco-action*. Natural History Museum. https://www.youtube.com/watch?v=wd0DoqSDDEw

O'Leary, Z. (2017). *Doing your research project* (3rd ed.). SAGE.

Ojala, M. (2015). Hope in the Face of Climate Change: Associations With Environmental Engagement and Student Perceptions of Teachers' Emotion Communication Style and Future Orientation. *The Journal of Environmental Education*, *46*(3), 133-148. https://doi.org/10.1080/00958964.2015.1021662

Ojala, M. (2021). Safe spaces or a pedagogy of discomfort? Senior highschool teachers' meta-emotion philosophies and climate change education. *The Journal of Environmental Education*,, *52*(1), 40-52. https://doi.org/DOI: 10.1080/00958964.2020.1845589

Olivier, E., Archambault, I., De Clercq, M., & Galand, B. (2018). Student Self-Efficacy, Classroom Engagement, and Academic Achievement: Comparing Three Theoretical Frameworks. *Journal of youth and adolescence*, *48*(2), 326-340. https://doi.org/10.1007/s10964-018-0952-0

Olsson, D., & Gericke, N. (2016). The adolescent dip in students' sustainability consciousness—Implications for education for sustainable development. *The Journal of Environmental Education*, *47*(1), 35-51. https://doi.org/10.1080/00958964.2015.1075464

Oppong, S. (2014). A critique of the philosophical underpinnings. *Academicus*, *10*(10), 242-254. https://doi.org/10.7336/academicus.2014.10.17

Orr, D. (2020). *Democracy Unchained: How to Rebuild Government for the People*. La Vergne: The New Press.

Orr, D. W. (1992). *Ecological literacy : education and the transition to a postmodern world*. State University of New York Press.

Owens, S., & Driffill, L. (2008). How to change attitudes and behaviours in the context of energy. *Energy Policy*, *36*(12), 4412-4418. https://doi.org/https://doi.org/10.1016/j.enpol.2008.09.031

Palmer, J. (2002). *Environmental education in the twenty first centure: Theory, practise, progress and promise*. 2002.

Panel, E. A. (2021). Aotearoa New Zealand's histories: a response to draft curriculum. *Royal Society Te Apārangi. Available at: https://issuu. com/royalsocietynz/docs/aotearoa-new-zealand-histories-response-to-draft-c*.

Paterson, M. (2021). *Down but not out in COP26*. Bristol University Press. https://www.transformingsociety.co.uk/2021/11/30/down-but-not-out-in-cop26/?utm_source=rss&utm_medium=rss&utm_campaign=down-but-not-out-in-cop26

Patterson, J. (2019). *Climate change bill, independent commission announced*. Radio New Zealand. https://www.radionz.co.nz/news/political/388726/climate-change-bill-independent-commission-announced

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.. ed.). Sage Publications.

Payne, P. (2015). Critical Curriculum Theory and Slow Ecopedagogical Activism. *Australian Journal of Environmental Education*, *31*(2), 165-193. https://doi.org/10.1017/aee.2015.32

Pedler, M., Hudson, S., & Yeigh, T. (2020). *The teachers' role in student engagement: A review* (Vol. 45). Edith Cowan University. https://doi.org/10.3316/ielapa.270830255864389

Pelling, M., Chow, W. T. L., Chu, E., Dawson, R., Dodman, D., Fraser, A., Hayward, B., Khirfan, L., McPhearson, T., Prakash, A., & Ziervogel, G. (2022). A climate resilience research renewal agenda: learning lessons from the COVID-19 pandemic for urban climate resilience. *Climate and development*, *14*(7), 617-624. https://doi.org/10.1080/17565529.2021.1956411

Pelzang, R., & Hutchinson, A. (2018). Establishing cultural integrity in qualitative research: Reflections from a cross-cultural study. *International Journal of Qualitative Methods*, *17*, 1-9. https://doi.org/10.1177/1609406917749702

Perkins, K. M., Munguia, N., Moure-Eraso, R., Delakowitz, B., Giannetti, B. F., Liu, G., Nurunnabi, M., Will, M., & Velazquez, L. (2018). International perspectives on the pedagogy of climate change. *Journal of Cleaner Production*, *200*, 1043-1052. https://doi.org/10.1016/j.jclepro.2018.07.296

Peters, R., & Filipova, A. (2009). Optimizing cognitive-dissonance literacy in ethics education. *Public Integrity*, *11*(3), 201-220. https://doi.org/10.2753/PIN1099-9922110301

Peters, W. (2019). *Acting PM Winston Peters against school climate strike* [Interview]. https://www.rnz.co.nz/national/programmes/morningreport/audio/2018714590/acting-pm-winston-peters-against-school-climate-strike

Pihkala, P. (2020). Eco-anxiety and environmental education. *Sustainability*, *12*(23), 1-38.

Plutzer, E., Mccaffrey, M., Rosenau, J., Berbeco, M., & Reid, A. (2016). Climate confusion among U.S. teachers. *Science, Vol.351(6274)*, 664-665.

Pou, D. (2021). *Let's talk biodiversity* Streaming live from the Flagship Education Centre www.sustainablecoastlines.org. https://www.facebook.com/watch/live/?v=197503825630968&ref=watch_permalink

Pratt, A. (2009). Critical realism/critical realist geographies. In R. K. N. Thrift (Ed.), *International encyclopedia of human geography* (Vol. 2, pp. 379-384). Elsevier.

QSR International Pty Ltd. (2018). *NVivo (Version 12)*. In https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

Radio New Zealand. (2019a). *Climate change protest on school day divides MPs* https://www.rnz.co.nz/news/political/384012/climate-change-protest-on-school-day-divides-mps

Radio New Zealand. (2019b). School Strikes 4 Climate: Protestors call for less talk, more action. *Radio New Zealand*. https://www.rnz.co.nz/news/national/440166/school-strikes-4-climate-protestors-call-for-less-talk-more-action

Radio New Zealand. (2019c). Thousands - young and old - demand government action on climate change. *Radio New Zealand*. https://www.rnz.co.nz/news/national/399778/thousands-young-and-old-demand-government-action-on-climate-change

Radio New Zealand. (2019d). The Panel In *Why some people hate Greta Thunberg*. https://www.rnz.co.nz/national/programmes/thepanel/audio/2018714195/why-some-people-hate-greta-thunberg

Radio New Zealand. (2022). *Thousands of students take part in school strike for climate: 'We want a future on the planet'*. https://www.rnz.co.nz/news/national/475352/thousands-of-students-take-part-in-school-strike-for-climate-we-want-a-future-on-the-planet

Rameka, L., & Glasgow, A. (2017). Tuākana/tēina agency in early childhood education. Early Childhood Folio. *Earliy Childhood Folio*, *21*(1), 27-32. https://doi.org/10.18296/ecf.0036

Ramelli, S., Ossola, E., & Rancan, M. (2020). Climate Sin Stocks: Stock Price Reactions to Global Climate Strikes. *JRC Working Papers in Economics and Finance, JRC120974*. https://doi.org/10.5167/uzh-188494

Rapley, C. (2013). Engaging with climate change: Psychoanalytic and interdisciplinary perspectives. In S. Weintrobe (Ed.), *Engaging with climate change: Psychoanalytic and interdisciplimary perspectives*. Routledge.

Reeves, G. (2017). We should be teaching more politics in schools. https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11899690

Reid, A. (2019). Climate change education and research: possibilities and potentials versus problems and perils? *Environmental Education Research*, *25*(6), 767-790. https://doi.org/10.1080/13504622.2019.1664075

Reinsfield, E. (2018). *The potential for a future-focused curriculum in New Zealand: The perceptions and practice of six secondary school technology teachers* [Doctoral thesis, The University of Waikato]. Research Commons. Hamilton, New Zealand. https://hdl.handle.net/10289/11939

Research New Zealand. (2019). *2019 Gender Attitudes Survey*. National Council of Women of New Zealand. https://genderequal.nz/wp-content/uploads/2020/06/2019-Gender-Attitudes-Survey-Online.pdf

Richter, J. (2011). *Power in Movement: Social Movements and Contentious Politics*. Cambridge University Press. https://doi.org/10.1017/CBO9780511973529

Rincon, P. (2019, December 3). Greta Thunberg: People underestimate 'angry kids'. *BBC news*. https://www.bbc.com/news/science-environment-50644395

Rincones, R., Peña, I., & Canaba, K. C. (2021). A Call for Rethinking Schooling and Leadership in the Time of COVID-19. Frontiers in Education,

Ripple, W. J., Wolf, C., Newsome, T. M., Barnard, P., & Moomaw, W. R. (2019). World scientists' warning of a climate emergency. *BioScience*, *70*(1), 8-12. https://doi.org/10.1093/biosci/biz088

Ritchie, H., & Roser, M. (2021). Forests and deforestation. *Our World in Data*. https://ourworldindata.org/forests-and-deforestation

Robinson, K., & Aronica, L. (2015). *Creative schools. The grassroots revolution that's transforming education*. Viking.

Robinson, M., & Shine, T. (2018). Achieving a climate justice pathway to 1.5 °C. *Nature Climate Change*, *8*(7), 564-569. https://doi.org/10.1038/s41558-018-0189-7

Robinson, T. (2020). *Traditional masculinity and counselling: a study of traditional masculine norms in New Zealand and their influence on men's engagement in individual counselling services* University of Canterbuy. http://dx.doi.org/10.26021/985

Robinson, V. M., Hohepa, M. K., & Lloyd, C. (2009). *School leadership and student outcomes : identifying what works and why : best evidence synthesis iteration (BES)*. Ministry of Education.

Rosen, A. M. (2015). The wrong solution at the right time: The failure of the Kyoto Protocol on climate change. *Politics & Policy*, *43*(1), 30-58. https://doi.org/https://doi.org/10.1111/polp.12105

Roth, W., & von Unger, H. (2018). Current perspectives on research ethics in qualitative research. *Forum, qualitative social research*, *19*(3). https://doi.org/10.17169/fqs-19.3.3155

Roy, E. (2019). 'Nothing else matters': school climate strikes sweep New Zealand. *The Guardian*. https://www.theguardian.com/environment/2019/sep/27/nothing-else-matters-school-climate-strikes-sweep-new-zealand

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68-78. https://doi.org/10.1037/0003-066X.55.1.68

Sabherwal, A., Ballew, M. T., van der Linden, S., Gustafson, A., Goldberg, M. H., Maibach, E. W., Kotcher, J. E., Swim, J. K., Rosenthal, S. A., & Leiserowitz, A. (2021). The Greta Thunberg Effect: Familiarity with Greta Thunberg predicts intentions to engage in climate activism in the United States. *Journal of Applied Social Psychology*, *51*(4), 321-333. https://doi.org/https://doi.org/10.1111/jasp.12737

Sadan, N., & Alkaher, I. (2021). Development and formation of ESE policy: Learning from teachers and local authorities. *Environmental education research*, *27*(2), 192-216. https://doi.org/10.1080/13504622.2020.1847255

Şan, S., & Gedikler, H. G. (2020). Social perspective on child education: Society, democracy, and political literacy in child education. In *Sociological perspectives on educating children in contemporary society* (pp. 185-205). IGI Global.

Sanjari, M., Bahramnezhad, F., Fomani, F. K., Shoghi, M., & Cheraghi, M. A. (2014). Ethical challenges of researchers in qualitative studies: the necessity to develop a specific guideline. *Journal of medical ethics and history of medicine*, *7*, 14-14. https://www.ncbi.nlm.nih.gov/pubmed/25512833

Sanson, A. V., & Burke, S. E. L. (2020). *Climate Change and Children: An Issue of Intergenerational Justice* (N. Balvin & D. J. Christie, Eds.). Springer International Publishing. https://doi.org/10.1007/978-3-030-22176-8_21

Santamaría, A. P., Webber, M., Santamaría, L. J., & Dam, L. I. (2015). Partnership for change: Promoting effective leadership practices for indigenous educational success in Aotearoa New Zealand. *eJEP: eJournal of Education Policy*.

Santone, S. (2018). *Reframing the curriculum: Design for social justice and sustainability*. Routledge.

Sass, W., Pauw, J., Maeyer, S., & Petegem, P. (2021). Development and validation of an instrument for measuring action competence in sustainable development within early adolescents: the action competence in sustainable development questionnaire (ACiSD-Q). *Environmental education research*, *27*(9), 1284-1304. https://doi.org/10.1080/13504622.2021.1888887

School News New Zealand. (2022). *Te Tiriti o waitangi - living the values*. https://www.schoolnews.co.nz/2016/11/te-tiriti-o-waitangi-living-the-values/

Science Media Centre. (2019). *Student-led climate strikes – Expert Reaction*. https://www.sciencemediacentre.co.nz/2019/03/12/student-led-climate-strikes-expert-reaction/

Scott, S., Scott, D. E., & Webber, C. F. (2016). *Leadership of Assessment, Inclusion, and Learning* (1st ed. 2016 ed., Vol. 3). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-23347-5

Semenza, J. C., Hall, D. E., Wilson, D. J., Bontempo, B. D., Sailor, D. J., & George, L. A. (2008). Public perception of climate change: Voluntary mitigation and barriers to

behavior change. *American Journal of Preventive Medicine*, *35*(5), 479-487. https://doi.org/https://doi.org/10.1016/j.amepre.2008.08.020

Sena, K. (2021). *Recognizing indigenous peoples' land interests is critical for people and nature*. World Wildlife Fund. https://www.worldwildlife.org/stories/recognizing-indigenous-peoples-land-interests-is-critical-for-people-and-nature

Service, B., & Thornton, K. (2019). Learning for principals: New Zealand secondary principals describe their reality. *Educational Management Administration & Leadership*, *49*(1), 76-92. https://doi.org/10.1177/1741143219884673

Shaw, J. (2019). *James Shaw denies climate change strategy just talk, admits it doesn't fly with student protestors* [Interview]. TVNZ. https://www.1news.co.nz/2019/09/30/james-shaw-denies-climate-change-strategy-just-talk-admits-it-doesnt-fly-with-student-protestors/

Shaw, J. (2021). *New Zealand's National Statement to COP26*. New Zealand Government. https://www.beehive.govt.nz/speech/new-zealands-national-statement-cop26

Shea, N. A., Mouza, C., & Drewes, A. (2016). Climate change professional development: Design, implementation, and initial outcomes on teacher learning, practice, and student beliefs. *Journal of science teacher education*, *27*(3), 235-258. https://doi.org/10.1007/s10972-016-9456-5

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, *22*(2), 63-75. https://doi.org/10.3233/EFI-2004-22201

Sheshadri, A., Borrus, M., Yoder, M., & Robinson, T. (2021). Midlatitude error growth in atmospheric GCMs: The role of eddy growth rate. *Advancing Earth and Space Science*. https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2021GL096126

Shields, C. M. (2017). *Transformative Leadership in Education: Equitable and Socially Just Change in an Uncertain and Complex World* (Vol. 2nd ed). Routledge. https://doi.org/10.4324/9781315207148

Shor, I. (1993). Education is politics. Paulo Friere's critical pedagogy. In P. McLaren & P. Leonard (Eds.), *Paulo Freire: A critical encounter*. Routledge.

Shue, H. (2014). *Climate Justice: Vulnerability and Protection*. Oxford: Oxford University Press.

Sidebottom, K. (2021). *Rhizomes, assemblages and nomad war machines–re-imagining curriculum development for posthuman times* Lancaster University (United Kingdom)]. ProQuest. https://www.proquest.com/openview/f9b283d3949bc0dc352328918ab84b40/1?pq-origsite=gscholar&cbl=2026366&diss=y

Silverman, D. (2016). *Qualitative research* (4E ed.). London: SAGE Publications.

Singleton, J. (2016). Head, heart and hands model for transformative learning:Place as context for changing sustainability values. *Journal of sustainability education*. http://www.susted.com/wordpress/content/head-heart-and-hands-model-for-transformative-learning-place-as-context-for-changing-sustainability-values_2015_03/

Skamp, K., Boyes, E., Stanisstreet, M., Rodriguez, M., Malandrakis, G., Fortner, R., Kilinc, A., Taylor, N., Choker, K., Shweta, D., Ambusaidi, A., Cheong, I., Kim, M., & Yoon, H.-G. (2021). Voting for Change: an International Study of Students' Willingness to Support Measures to Ameliorate Climate Change. *Research in science education (Australasian Science Education Research Association)*, *51*(3), 861-887. https://doi.org/10.1007/s11165-019-09864-2

Slayton, J. D. (2018, 2021/10/17). *Skills for Conducting a Semi-Structured Interview* London, Sage research methods. https://methods.sagepub.com/video/skills-for-conducting-a-semi-structured-interview

Small, Z. (2019). Clarke Gayford tells climate strikers to 'wear punishment like a badge of honour'. *Newshub*. https://www.newshub.co.nz/home/politics/2019/03/clarke-gayford-tells-climate-strikers-to-wear-punishment-like-a-badge-of-honour.html

Smallman, G. (2019). The emerging voices of youth activists. *Lancet*, *393*(10183), 1774-1774. https://doi.org/10.1016/S0140-6736(19)30991-2

Smith, G. H. (2003). *Indigenous Struggle for the transformation of education and schooling* Alaskan Federation of Natives (AFN), Anchorage, Alaska, U.S. http://www.rangahau.co.nz/assets/Smith,%20G/indigenous_struggle.pdf

Smith, H. (2020). Collaborative Strategies for Re-Enhancing Hapū Connections to Lands and Making Changes with Our Climate. *The Contemporary Pacific*, *32*(1), 21-46. https://doi.org/10.1353/cp.2020.0002

Smith, L. (2021). *Decolonizing methodologies: Research and indigenous peoples* (Third edition. ed.). Zed.

Smith, L. V., Tarui, N., & Yamagata, T. (2021). Assessing the impact of COVID-19 on global fossil fuel consumption and CO2 emissions. *Energy Economics*, *97*, 105170. https://doi.org/https://doi.org/10.1016/j.eneco.2021.105170

Smith, M. (2022). Te Aroha ki a Papatūānuku Love for our World - Public hui on climate change. Royal Society Te Apārangi,

Speth, G. (2015). *Gus Speth Calls for a New Environmentalism*, Antioch University New England. https://www.youtube.com/watch?v=ch5i1zEsXZA

Srivastava, P., & Hopwood, N. (2009). A practical iterative framework for qualitative data analysis. *International Journal of Qualitative Methods*, *8*(1), 76-84. https://doi.org/10.1177/160940690900800107

Steffen, W., Rockström, J., Richardson, K., Lenton, T. M., Folke, C., Liverman, D., Summerhayes, C. P., Barnosky, A. D., Cornell, S. E., Crucifix, M., Donges, J. F., Fetzer, I., Lade, S. J., Scheffer, M., Winkelmann, R., & Schellnhuber, H. J. (2018). Trajectories of the Earth System in the Anthropocene. *Proceedings of the National Academy of Sciences*, *115*(33), 8252-8259. https://doi.org/10.1073/pnas.1810141115

Stevens, C. L., Paul-Burke, K., & Russell, P. (2021). Pūtahitanga: the intersection of western science and mātauranga Māori in the context of Aotearoa New Zealand's physical oceanography. *New Zealand journal of marine and freshwater research*, *55*(1), 249-263. https://doi.org/10.1080/00288330.2019.1698621

Stevenson, K., Peterson, M., & Bondell, H. (2016). The influence of personal beliefs, friends, and family in building climate change concern among adolescents. *Environmental Education Research*, *25*(6), 832-845. https://doi.org/10.1080/13504622.2016.1177712

Stevenson, K., Peterson, M., Bondell, H., Moore, S., & Carrier, S. (2014). Overcoming skepticism with education: interacting influences of worldview and climate change knowledge on perceived climate change risk among adolescents. *An Interdisciplinary, International Journal Devoted to the Description, Causes and Implications of Climatic Change*, *126*(3), 293-304. https://doi.org/10.1007/s10584-014-1228-7

Stuart, D., Gunderson, R., & Petersen, B. (2020). The climate crisis as a catalyst for emancipatory transformation: An examination of the possible. *International sociology*, *35*(4), 433-456. https://doi.org/10.1177/0268580920915067

Sutherland, M. (2019). *Climate strike: Protest is in Kiwis DNA and the climate needs us to take action*. https://www.stuff.co.nz/environment/climate-news/116019953/climate-strike-protest-is-in-kiwis-dna-and-the-climate-needs-us-to-take-action

Tahseen, J. (2018). *Routledge handbook of climate Justice*. Taylor and Francis. https://doi.org/10.4324/9781315537689

Tattersall, A., Hinchliffe, J., & Yajman, V. (2022). School strike for climate are leading the way: how their people power strategies are generating distinctive pathways for leadership development. *Australian Journal of Environmental Education*, 1-17. https://doi.org/10.1017/aee.2021.2

Te Heuheu Tukino, V., & Orange, C. (2017). *Te Tiriti o Waitangi: The Treaty of Waitangi, 1840* (First ebook edition. ed.). Archives New Zealand Te Rua Mahara o Te Kāwanatanga.

Teach the future. (n.d). *Current climate education is inadequate*. https://www.teachthefuture.uk/

Teaching Council of Aotearoa New Zealand. (2022). *Our Code, Our Standards*. https://teachingcouncil.nz/professional-practice/our-code-our-standards/

Thaler, T., Fuchs, S., Priest, S., & Doorn, N. (2017). Social justice in the context of adaptation to climate change—reflecting on different policy approaches to distribute and allocate flood risk management. *Regional environmental change*, *18*(2), 305-309. https://doi.org/10.1007/s10113-017-1272-8

The University of Waikato. (n.d). *Ethical Conduct in Human Research and Related Activities Regulations*. https://calendar.waikato.ac.nz/assessment/ethicalConduct.html

Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education in the 1990s. *Environmental Education Research*, *1*(2), 195-212. https://doi.org/10.1080/1350462950010206

Toledo, V. M. (2001). Indigenous peoples and biodiversity. *Encyclopedia of biodiversity*, *3*, 451-463.

Torres-Olave, B. (2021). Pedagogy of hope: Reliving pedagogy of the oppressed: By Paulo Freire (translated by Robert Barr, 1992 original version). *Educational review (Birmingham)*, *73*(1), 128-128. https://doi.org/10.1080/00131911.2020.1766207

Tulloch, L. (2016). The transnational state, neoliberalism and environmental education policy: a New Zealand case study. *Contemporary Readings in Law and Social Justice*, *8*(2), 170-195.

UNESCO. (1975). *International workshop of environmental education the Belgrade Charter: A framework for environmental education*. http://unesdoc.unesco.org/images/0001/000177/017772eb.pdf

UNESCO. (1977). *Intergovernmental conference on environmental education Tbilisi (USSR) - final report*. http://unesdoc.unesco.org/images/0003/000327/032763eo.pdf

UNESCO. (2021). *Learn for our planet: A global review of how environmental issues are integrated in education*. https://unesdoc.unesco.org/ark:/48223/pf0000377362

UNFCCC. (2022). *History of the Convention*. 2022 United Nations Framework Convention on Climate Change. https://unfccc.int/process/the-convention/history-of-the-convention#eq-1

United Nations. (2006). *Social Justice in an Open World. The Role of the United Nations*. https://www.un.org/esa/socdev/documents/ifsd/SocialJustice.pdf

United Nations. (2016). *The Sustainable Development Goals Report 2016*. https://unstats.un.org/sdgs/report/2016/The%20Sustainable%20Development%20Goals%20Report%202016.pdf

United Nations. (2021). *IPCC report: 'code red' for human driven global heating, warns UN chief*. https://news.un.org/en/story/2021/08/1097362

United Nations. (n.d-a). *2019 Climate Action Summit*. United Nations. https://www.un.org/en/climatechange/2019-climate-action-summit

United Nations. (n.d-b). Definition of youth. In *United Nations Department of Economic and Social Affairs (UNDESA)*.

United Nations Sustainable Development. (1999). *Agenda 21: Programme of action for sustainable development*. Retrieved June from http://www.bgci.org/worldwide/article/0011/

Unwin, H., & Tuterangiwhiu, T. (2021). *He kāinga rangahau: Developing a framework for research that is just and equitable for indigenous peoples*. https://www.cawthron.org.nz/research/he-kainga-rangahau/

Valenzuela, S. (2013). Unpacking the use of social media for protest behavior: The roles of information, opinion expression, and activism. *American Behavioral Scientist, 57*(7), 920-942. https://doi.org/10.1177/0002764213479375

van der Linden, S., Maibach, E., & Leiserowitz, A. (2015). Improving Public Engagement With Climate Change:Five "Best Practice" Insights From Psychological Science. *Perspectives on Psychological Science, 10*(6), 758-763. https://doi.org/10.1177/1745691615598516

Vare, P., & Scott, W. (2007). Learning for a change: Exploring the relationship between education and sustainable development. *Journal of Education for Sustainable Development, 1*(2), 191-198. https://doi.org/10.1177/097340820700100209

Verlie, B. (2017). Rethinking climate education: Climate as entanglement. *Educational studies (Ames), 53*(6), 560-572. https://doi.org/10.1080/00131946.2017.1357555

Verlie, B. (2018). From action to intra-action? Agency, identity and 'goals' in a relational approach to climate change education. *Environmental Education Research*, 1-15. https://doi.org/10.1080/13504622.2018.1497147

Verlie, B. (2022). *Learning to live with climate change: from anxiety to transformation*. Routledge.

Verlie, B., Clark, E., Jarrett, T., & Supriyono, E. (2020). Educators' experiences and strategies for responding to ecological distress. *Australian Journal of Environmental Education*, 1-15. https://doi.org/10.1017/aee.2020.34

Verlie, B., & Flynn, A. (2022). School strike for climate: A reckoning for education. *Australian Journal of Environmental Education*, 1-12. https://doi.org/doi:10.1017/aee.2022.5

Walker, C. (2020). Uneven solidarity: The school strikes for climate in global and intergenerational perspective. *Sustainable Earth, 3*(1), 5. https://doi.org/10.1186/s42055-020-00024-3

Wallen, E., & Fraenkel, J. (2001). *Educational research: A guide to the process*. Lawrence Erlbaum Associates Inc.

Walls, J. (2019). Climate change march: Thousands of schoolkids' action inspired by Greta Thunberg. *NZ Herald*. https://www.nzherald.co.nz/nz/climate-change-march-thousands-of-schoolkids-action-inspired-by-greta-thunberg/VVKHXTTIPBOTPJETQLF74664SI/

Wang, M.-T., Kiuru, N., Degol, J. L., & Salmela-Aro, K. (2018). Friends, academic achievement, and school engagement during adolescence: A social network approach to peer influence and selection effects. *Learning and Instruction*, *58*, 148-160. https://doi.org/https://doi.org/10.1016/j.learninstruc.2018.06.003

Wang, M. T., & Degol, J. (2014). Staying engaged: Knowledge and research needs in student engagement. *Child Development Perspectives*, *8*(3), 137-143. https://doi.org/10.1111/cdep.12073

Wannan, O. (2021). Pasifika voice takes focus in climate doco. *Stuff*. https://www.stuff.co.nz/environment/climate-news/125374597/pasifika-voice-takes-focus-in-climate-doco

Warner, B. P., & Elser, M. (2015). How do sustainable schools integrate sustainability education? An assessment of certified sustainable k–12 schools in the united states. *The Journal of Environmental Education*, *46*(1), 1-22. https://doi.org/10.1080/00958964.2014.953020

Wasserman, R. (2013). Ethical issues and guidelines for conducting data analysis in psychological research. *Ethics & Behavior*, *23*(1), 3-15. https://doi.org/10.1080/10508422.2012.728472

Watts, J. (2019). Greta Thunberg, schoolgirl, climate change warrior: some people can't let things go. I can't. *The Guardian*. https://www.theguardian.com/world/2019/mar/11/greta-thunberg-schoolgirl-climate-change-warrior-some-people-can-let-things-go-i-cant

Wenmonth, D. (2014). *Ten Trends 2014: Agency*. https://edtalks.org/#/video/ten-trends-2014-agency

Whaanga, H., Wehi, P., Cox, M., Roa, T., & Kusabs, I. (2018). Māori oral traditions record and convey indigenous knowledge of marine and freshwater resources. *New Zealand Journal of Marine and Freshwater Research*, *52*(4), 487-496.

White, P., Ferguson, J., O'Connor Smith, N., & O'Shea Carre, H. (2021). School strikers enacting politics for climate justice: Daring to think differently about education. *Australian Journal of Environmental Education*, 1-14. https://doi.org/10.1017/aee.2021.24

White, R. D. (2012). *Crimes against nature: Environmental criminology and ecological justice*. Routledge. https://doi.org/10.4324/9781315880723

Whyte, K. (2020). Too late for indigenous climate justice: Ecological and relational tipping points. *Wiley Interdisciplinary Reviews: Climate Change*, *11*(1), e603-e603. https://doi.org/10.1002/wcc.603

Wienhues, A. (2020). *Ecological Justice and the extinction crisis: giving living beings their due*. Bristol University Press. https://doi.org/DOI: 10.46692/9781529208528

Williams, A. (2022). Aotearoa kicks off a worldwide climate change strike. *The Spinoff*. https://thespinoff.co.nz/society/22-09-2022/aotearoa-kicks-off-the-worldwide-climate-change-strike-tomorrow

Williams, P. (2012). Educating for sustainability in New Zealand: Success through Enviroschools. In M. Robertson (Ed.), *Schooling for sustainable development. A focus on Australia, New Zealand and the Oceanic Region*. Springer.

Winograd, K. (2016). *Education in times of environmental crises: Teaching children to be agents of change*. Routledge.

Wood, B. (2020). Youth-led climate strikes: fresh opportunities and enduring challenges for youth research - commentary to Bowman. *Fennia*, *198*(1-2). https://doi.org/10.11143/fennia.91089

Wood, B., Taylor, R., Atkins, R., & Johnston, M. (2017). *Creating active citizens? Interpreting, implementing and assessing 'personal social action' in NCEA social studies*. http://www.tlri.org.nz/sites/default/files/projects/TLRI%20Summary_Wood%28v2%29.pdf

Woolf, A., & Redmond, A. (2019). *Students who strike for climate change will be marked as truants, principals say*. Stuff. Retrieved March 07 from https://www.stuff.co.nz/environment/climate-news/111013724/students-who-strike-for-climate-change-will-be-marked-as-truants-principals-say

World Commission on Environment and Development. (1987). *Our common future*. http://mom.gov.af/Content/files/Bruntland_Report.pdf

Young, A. (2019). Zero Carbon Bill passes with almost unanimous support in Parliament. *New Zealand Herald*. https://www.nzherald.co.nz/nz/zero-carbon-bill-passes-with-almost-unanimous-support-in-parliament/EV6BTTOIFQSAHF74UVQBEXDRYI/

Zang, S. M., Benjenk, I., Breakey, S., Pusey-Reid, E., & Nicholas, P. K. (2021). The intersection of climate change with the era of COVID-19. *Public Health Nursing*, *38*(2), 321-335. https://doi.org/https://doi.org/10.1111/phn.12866

Zenghelis, D. (2016). Decarbonisation: Innovation and the economices of climate change. *Re-thinking capitalism*, *86*(1), 172-190.

Zepke, N. (2018). Student engagement in neo-liberal times: what is missing? *Higher Education Research & Development*, *37*(2), 433-446. https://doi.org/10.1080/07294360.2017.1370440

Zink, R. (2020). Envisioning a better future through interrelatedness and whanaungatanga. *set: Research Information for Teachers*, *3*, 18-22.

Zocher, J., Hougham, R. (2020). Implementing ecopedagogy as an experiential approach to decolonizing science education. *Journal of Experiential Education*, *43*(3), 232-247. https://doi.org/10.1177/1053825920908615

Appendices

Appendix A: Strike leaders information sheet and consent form

23rd March 2020

Kia ora *Name*

Thank you for agreeing to be interviewed for my doctoral study on the climate strikes. My research will consider what educational value may have been gained by the students who participated in them. By exploring student motivation and engagement in the strikes we may be able to increase our understanding of how to better engage students towards environmental literacy and climate change literacy in secondary schools.

The interview will ideally be conducted via Zoom Video Conferencing, and it will be recorded and transcribed. The interview should take less than 30 minutes. A copy of your interview transcript will be sent to you and there will be a two-week time period for you to review and amend your transcript if you choose to.

Data collected during the study may be used in my doctoral thesis, publications or presentations. I will not use your name, the name of any school you may be associated with or the names of other participants in any publications or presentations. The information gathered will be securely stored. You can decline to be involved in the research and can choose to withdraw any or all data you have provided until the end of the two-week period you have to review your interview transcript. If you choose to withdraw, I will destroy any data gathered from you.

I appreciate your consent to be involved as described. Your experiences and perspectives as a climate strike organiser will offer extremely valuable data. If you need any more details about the project, or issues that arise for you during the project, please contact me Ria Bright at mlb46@students.waikato.ac.nz If I am unable to resolve your concerns, you may contact my research supervisor/manager, Chris Eames, email; chris.eames@waikato.ac.nz.

Thank you for your time and consideration to participate in this research.

Ngā mihi nui

Yours sincerely

Ria Bright

Waikato University EdD candidate

I have read the attached letter of information.

I understand that:

1. My participation in this research project is voluntary.

2. I have the right to withdraw from the research at any time up to two weeks after receiving my transcript to review.

3. Data will be collected in the ways specified in the accompanying letter. I acknowledge interviews will be recorded by an audio device. This data will be kept confidential and securely stored.

4. Data obtained during the research project will be used for the purpose of a doctoral thesis, published papers and making presentations. This data will be reported without identifying any of the participants or their organisations.

5. I can direct any questions to Ria Bright - mlb46@students.waikato.ac.nz

Name:_____

Signed:_____

Date:_____

Please return to mlb46@students.waikato.ac.nz

Appendix B: Teacher information and consent form

12th October 2020

Kia ora *Name*

Thank you for agreeing to be interviewed for my doctoral study on environmental/climate change education. Part of my research will consider what understanding educators might gain from the climate strikes of 2019 and that will be the focus of this interview. By exploring student motivation and engagement in the strikes we may be able to increase our understanding of how to better engage students towards environmental literacy and climate change literacy in secondary schools.

The interview will ideally be conducted via Zoom Video Conferencing, and it will be recorded and transcribed. The interview should take approximately 30 minutes. A copy of your interview transcript will be sent to you and there will be a two week time period for you to review and amend your transcript if you choose to.

Data collected during the study may be used in my doctoral thesis, publications or presentations. I will not use your name, the name of any school you may be associated with or the names of other participants in any publications or presentations. The information gathered will be securely stored. You can decline to be involved in the research and can choose to withdraw any or all data you have provided until the end of the two-week period you have to review your interview transcript. If you choose to withdraw, I will destroy any data gathered from you.

I appreciate your consent to be involved as described. Your experiences and perspectives as a teacher will offer extremely valuable data. If you need any more details about the project, or issues that arise for you during the project, please contact me Ria Bright at

mlb46@students.waikato.ac.nz If I am unable to resolve your concerns, you may contact my research supervisor/manager, Chris Eames, email; chris.eames@waikato.ac.nz.

Thank you for your time and consideration to participate in this research.

Ngā mihi nui
Yours sincerely
Ria Bright
Waikato University EdD candidate

I have read the attached letter of information.

I understand that:

1. My participation in this research project is voluntary.
2. I have the right to withdraw from the research at any time up to two weeks after receiving my transcript to review.
3. Data will be collected in the ways specified in the accompanying letter. I acknowledge interviews will be recorded by an audio device. This data will be kept confidential and securely stored.
4. Data obtained during the research project will be used for the purpose of a doctoral thesis, published papers and making presentations. This data will be reported without identifying any of the participants or their organisations.
5. I can direct any questions to Ria Bright - mlb46@students.waikato.ac.nz

Name: _____

Signed: _____

Date:_____

Please return to mlb46@students.waikato.ac.nz

Appendix C: Ethics approval

Te Kura Toi Tangata
Division of Education
The University of Waikato
Private Bag 3105
Hamilton, New Zealand, 3240

DivEd Ethics Committee

fedu.ethics@waikato.ac.nz
07 8384500 ext. 7870
www.waikato.ac.nz/education

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

27/11/2019

Dear Maria (Ria) Bright

Division of Education Ethics Application Approved FEDU090/19

I am pleased to advise you that your ethics application for the project entitled "Climate strikes: Their value in engaging and educating secondary school students" was approved by Te Kura Toi Tangata Division of Education Ethics Committee on November 27th, 2019.

Please be aware that the Te Kura Toi Tangata Division of Education Ethics Committee must be advised (by memo) of any changes to the details recorded in your ethics application. Please send any such advice to fedu.ethics@waikato.ac.nz. You will receive a memo of approval once the change(s) has been considered.

Kind regards

Co-chair
Te Kura Toi Tangata Division of Education Ethics Committee

Appendix D: Interview questions for strike leaders

Interview questions for strike leaders April 8th, 2020

- Video conferencing via Zoom
- Recorded interview on Zoom
- Pseudonyms will be used, school names and identifying information will not be transcribed or used in the data in any way
- A copy of the transcript will be emailed, participants have two weeks to return the script, edit the transcript and return or withdraw from the research

1. Tell me about your role with climate strikes.

2. How and why did you become involved?

3. Why do you think students were motivated to strike? What influence do you think Greta Thunberg had and why?

4. What do you think influenced students most to get involved?

5. Why do you think many students chose not to strike?

6. Where do you think students mainly get their information about climate change from?

7. Do you think climate change should be taught in schools? If so, how? And if so, how should it be taught? What might be the right level for learning about it?

8. Were the climate strikes a learning experience for you?

9. What do you think you learnt?

10. Do you think participating in climate strikes was a learning experience for other students too?

11. What might they have learned?

12. The NZ curriculum identifies 5 key abilities or competencies that are considered important. Thinking, using language and symbols, managing self, relating to others, participating and contributing. Do you think students developed any of these by participating in the strikes? (I will hold up a piece of paper with the key competencies written on it, to help with this question)

13. Has participation in the climate strikes helped you believe you can bring about change?

14. Do you think the climate strikes had any impact on the Zero Carbon Act or any other governmental decisions?

15. What more could be done to encourage climate action?

16. What more do you think you can you do?

17. How do you feel about the government and public response to Covid 19 compared to their response to climate change? What can we learn from the Covid 19 response?

18. Do you think the students will continue to strike in the future if nothing changes?

19. What would you hope educators can learn from the climate strikes?

20. What climate action would you like to see happen next?

21. What does the future hold for you?

Thank you 😊

Appendix E: Interview questions for teachers

Interview questions for strike leaders April 8th, 2020

- Video conferencing via Zoom
- Recorded interview on Zoom
- Pseudonyms will be used, school names and identifying information will not be transcribed or used in the data in any way
- A copy of the transcript will be emailed, participants have two weeks to return the script, edit the transcript and return or withdraw from the research

1. Tell me about your experience with the climate strikes. Were you supportive of them?

2. What was your school's stance towards the climate strikes? How did you feel about that?

3. Why do you think students were motivated to strike?

4. Why do you think many students choose not to strike?

5. Do you think there were learnings for students who attended the strikes? If so, what?

6. What do you think educators can learn from the climate strikes?

7. The climate strike leaders I interviewed felt teachers, politicians and adults generally do not understand the level of climate anxiety among youth. What are your thoughts on that?

8. The climate strike leaders also expressed concern at the apparent lack of climate change education in secondary schools. But an article in the *NZ Principal* mentions some outstanding practices in schools. Can you tell me what climate change education is offered in your school?

9. Do you think this is satisfactory? If not, what are the barriers?

10. Do you think CCE should be compulsory at secondary schools? If so, how would that look? How would it be implemented in an ideal world?

11. The student leaders interviewed felt empowered by the strikes, because they felt they were taking action and also because their understanding of political systems and processes improved. How well do you feel the current educational system prepares students for their civic/political responsibilities as adults?

12. Do you think that schools should take a role in supporting students to take action on issues of concern to them? Why/why not? If so, how might this be done?

13. What would you like to say to the climate strike leaders or youth who have genuine concerns for their future?

14. Is there anything else you would like to say?

Thank you for taking the time to be interviewed.

Appendix F: Document analysis. Shortened table of online media articles

Source	Date	author	Title n = 60	Text	Themes
RNZ	5 March 2019		Climate change protest on school day divides MPs	"Mr Bridges said a small proportion of school children closely followed climate change and he doubted anyone would contest their participation in the strike. What we wouldn't want to encourage is a situation where a whole lot of people who are fair-weather friends on this issue say, 'you know what, sweet, this is a day off school, I'm going to join the protest'," he said. National Party education spokesperson Nikki Kaye said government ministers should not be encouraging students to participate. Ms Handford said more [schools were supporting the strike than opposing it and it appeared likely that thousands of young people would participate.	Varied adult support
RNZ	18 September 2019	Harry Lock	How school children are coping with 'Eco-anxiety' as they worry about climate change	An Australian study has found that nearly 90 percent of children are worried about climate change. Nearly 70 percent of the children said they thought about climate change issues every day. Associate Professor in Psychology at the University of Auckland Dr Niki Harre described the anxiety as a "mist" over young people's future.	Eco- anxiety

RNZ	21 September 2019		Climate change protests spread on global day of action	The teenage activist was greeted like a rockstar at the rally on Friday, with chants of "Greta! Greta!" resounding around New York's Battery Park. "This is the biggest climate strike ever in history, and we all should be so proud of ourselves because we have done this together," the teenager told demonstrators. Ms Thunberg said about four million people took part in the strike around the world, "and we're still counting."	Youth activism, Greta as a role model
RNZ	15 Jun, 2021	Hamish Cardwell Of RNZ	School Strike 4 Climate Auckland declares itself racist and disbands	"School Strike 4 Climate Auckland has avoided, ignored, and tokenised black, indigenous and people of colour voices and demands, especially those of Pasifika and Māori individuals in the climate activism space," it said It said people of colour were disproportionately affected by climate change, so the fight for climate justice should be led by their voices and needs, not Pākehā ones.	Indigenous knowledge Diversity/racism
TVNZ Newshub	September 27, 2019	Irra Lee	Pasifika bring unique perspective to Auckland climate	co-ordinator Aigagalefili Fepulea'i Tapua'i talked about how youth organisation 4TK (4 Tha Kulture) was formed in South Auckland to "represent Southside" and "brown voices" after the first strike in March was scheduled on the first day of Polyfest. Luke Wijong he said he was one of the only organisers of Māori descent from the original team.	Indigenous inclusion

			change protest		
Newshub	14/03/2019	Duncan Garner	Duncan Garner: Climate strike just a day off school	Yes, it's the strike for the climate - an international movement. How trendy. And I bet principals really want to say no, but they feel if they do, they risk looking like a dinosaur. This generation is the most informed generation ever. With all the devices and apps you can poke a stick at. Why don't you just do it on Saturday? Use your personal time, your free time, your "me" time. Watch them bail, watch them flee. I think this march sets a dangerous precedent. Yet it's the one that I believe is the most self-important and entitled, and this march will achieve diddly squat.	Adult cynicism
Newshub	15/03/2019	Zane Small	Clarke Gayford tells climate strikers to 'wear punishment	Get bloody stuck in today kids. Wear any punishment like badge of honour," Gayford wrote in a tweet Thursday night. The strike has been met with scepticism by many who believe attending school is more important than striking, and that it should take place over the weekend instead. Deputy Prime Minister Winston Peters told Newshub: "We pay a lot of money for people to get educated. Attending school is compulsory in this country."	Adult support

			like a badge of honour'	National MP Judith Collins said last week it "won't help the world one bit".	
Newshub	27/09/2019	Katie Fitzgerald Jamie Ensor Mark Quinlivan Alice Wilkins	Thousands take to the streets for School Strike 4 Climate	Reported adults supporting and patronising strikers. Climate scientist Jacob Anderson was encouraged by the action. "The tide is starting to turn - look at what has been achieved in one year," he told the crowd. Don't underestimate the power movements like this will have to drive the transformation needed in the next decade." National's Nick Smith told the Wellington protestors it's about creating the right adaption plan. "The reality is the change is tougher and greater on our Pacific friends." National's agriculture spokesperson Todd Muller is calling for James Shaw, David Parker and Damien O'Connor to reject a message being expressed at a protest at Parliament. Signs read: "Help farmers phase out animal farming." "My generation, we were really worried about nuclear war... I do think we've just got to let them do what they want to do." Labour Party MP Willie Jackson said the kids need to calm down. "Sometimes young ones have got to just have a relax, have a good time too. As well as save the world. Good luck to all the young ones."	Varied adult support

Māori TV	20 April 2019	Jessica Tyson	Climate protests hit the streets around NZ	Extinction Rebellion mentioned London police have arrested over 400 XR members as a part of the groups international week of rebellion, he says. Last year, the United Nations said the world has 11 years to take action to limit climate chaos and reduce the risk of extreme heat, drought, flooding and poverty, says Brooks. Forest and Bird spokesperson, Chief executive Kevin Hague said, actually a synthesis of the Māori view of sustainable use of the environment and of Pākehā conservation traditions is going to be essential...so Forest and Bird are certainly looking for partnerships with iwi."	Indigenous knowledge
Newsroom	NOV 16, 2021	MARC DAALDER	Why the Government needs you to protest for the climate	The non-binding nature of the Paris Agreement places the burden on everyday New Zealanders to push the Government to go further and faster on climate change. the recently-concluded Glasgow Climate Pact - place certain binding requirements on countries to reduce emissions, the actual ambition of each nation's targets is left to its government. "In the end, it has to be socially unacceptable to continue down the path that we are on currently." – Sophie Handford Brownyn Hayward "That puts enormous pressure, that I worry about, on communities like students and youth protesters, indigenous leaders and indigenous communities, who are already carrying a quite significant burden of both feeling the effects of climate change and anxiety about the changing climate. On top of that, they're also expected to	COP26 Climate anxiety Indigenous communities

				turn up in large numbers and to protest and to make themselves heard and to somehow pressure or lobby their government," she said. It wasn't until the end of 2019 and the huge turnout in September that Handford said she really moved from a place of despair to a place of hope.	
NZ Herald	9 Apr, 2021		Thousands of students march in Wellington for urgent climate change action	James Shaw, " there is an element of anger that the speed of change that is required is not being lived up to and I have to say I agree with them on that" It's clear that our government is not doing enough, all these people here think so, it's not just a small minority. The movement's key demands would be transitioning into a greener economy, and assisting Pacific nations to do the same. High school student Rebecca Elder said the strike's demands included phasing out fossil fuels, investing in clean energy, implementing climate education in schools and de-carbonising the agriculture sector. "We've also got to make sure that we've got the voices of Pasifika people in Aotearoa in our plans to reduce emissions and how we adapt to the effects of climate change." He also supported a transforming of the curriculum to see climate change education imbedded into all parts of the school system.	Just transitioning Embed CCE into curriculum
NZ Herald	25/09/2019		Climate change: Striking for a	Climate activist Catherine Murupaenga-Ikenn organises the Cameron St gathering from 8am-1pm and says she would like to see as many protesters join as possible.	Apathy

			better future in Northland	Murupaenga-Ikenn believes the urgency of the situation hasn't settled in people's hearts yet because they are disconnected from society and nature.	
NZ Herald	27 Sep, 2019	Jamie Morton	Climate striking kids' plea to adults: march with us	Nearly 100 businesses and universities around the country today join pupils for the third - and expectedly biggest - School Strike 4 Climate protest. Handford was heartened that workers from 90 businesses – ranging from bookshops and bakeries to consultancies and architecture firms – would be downing tools to take part.	
Stuff	Sep 24 2019	Mia Sutherland		OPINION: If you stepped outside into your city centre on Friday, you would have found it hard to miss the chalking, posters, or art all speaking one message: strike for the climate. towns from Russell to Invercargill with our voices, imploring everyone everywhere to use their time to strike for systemic change - the only way we can make a difference to this crisis. Just like our ancestors, we are protesting injustice. Our protests are practical history lessons; we've seen what New Zealand's legacy is, we're reinforcing it.	Activism Social justice
Stuff	Sep 27 2019	Josephine Franks	Climate change strike: Up to 80,000	Luke Wijohn, "It's insane that a bunch of teenagers got 80,000 people out onto the street. I've got hope again," he said.	Activism Hope

			protesters form human chain in Auckland	"I'm here today to remind governments they need to take into account indigenous values in our future and our climate," she said. "A fight for climate justice is a fight for indigenous rights".	Indigenous rights
Stuff	Mar 24 2021	Joel MacManus	Why the leaders of School Strike 4 Climate had to move on	Ground roots start of ANZ strikes with Sophie Handford. Diverse reactions from principals. Success with NZ having the highest turn out per capita at 3.5% Inclusive nature of the organisation "Handford always insisted decisions would come from the ground up, not the top-down, and would be made democratically." Sophie Handford was nearing the end of her Year 13 when she took notice of the growing global School Strike movement. She wondered if there was a chapter in New Zealand and learnt there was none. With a group of friends, she created a Facebook page, Instagram, and a website, and the requests started pouring in. School principals had been sending mixed messages in the lead-up to the strike. Some supported the action, while others were threatening to punish students who attended. Secondary Principals Association president and Pakuranga College principal Michael Williams called the strikes a waste of time, saying students' impact on climate change would be "probably zero". New Zealand had the highest per capita turnout of any major country, with 170,000 people, or 3.5 per cent of the population, marching in the streets.	Political agency

The Spinoff	MAY 26, 2019	Zoe Mills is a 17 year old high school student and one of thousands who joined the global climate strikes. She explains why her generation feel this moment so acutely.		2050 is simply not good enough. We need action by 2030, at the very latest. In 2050, I will be 48 years old. If the bill continues into law in its current form, the effects of climate change will not only be at a point of irreversible damage, but the bill will have little to no effect lowering the earth's temperature. At most, we have 12 years to figure out a solution. That's the same amount of years that I've been in school. politicians and world leaders and to get them to "wake up" on climate action. We're not striking because we want media attention. We're not striking because we have nothing better to do. We're striking because we are absolutely terrified.	Student voice Anxiety Frustration
The Spinoff	SEPTEMBER 27, 2019		The Spinoff and the #climatestrike For three hours, we're	Being a culture that has living ties to lands, rivers and seas, Māori never had the luxury of ignoring the mess for a couple of centuries and then suddenly wondering why the skies were choking and the seas were rising and the earth was on fire. We know what happened. We watched as our land was stolen and used for agriculture that poisoned our rivers; we watched as expansion destroyed native species and forests inch by agonising inch. Māori have always been on the frontline of protests about threats to our environment, from nuclear testing to Standing Rock. We have begged industries and	Indigenous rights

			going quiet. Here's why	governments repeatedly to stop exploiting Papatūānuku and we have consistently been ignored.	
The Guardian	Wed 25 Sep 2019	Richard Flanagan	Greta Thunberg's 495-word UN speech points us to a future of hope – or despair	Enormous power of Greta's speech is timing. Thunberg's singular achievement was to present the climate change issue as a battle for power. In doing so she spoke with the authority of the millions who marched only a few days before. For this Donald Trump trolled her. He intuited her power and tried to destroy it through mockery. On Wednesday the Australian prime minister Scott Morrison, the nation's creepy gas lighter-in-chief, criticised Thunberg for similar reasons to Trump, saying, "I think we've got to caution against raising the anxieties of children in our country." a historic turning point where for the first time the power of we met the power of you without artifice, without compromise and with a ferocious courage.	Role model

Digital media outlets summary

Key words: Climate strikes 2019 New Zealand (Brand of media)