



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Research Commons

<http://researchcommons.waikato.ac.nz/>

Research Commons at the University of Waikato

Copyright Statement:

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

The thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not make them available to any other person.
- Authors control the copyright of their thesis. You will recognise the author's right to be identified as the author of the thesis, and due acknowledgement will be made to the author where appropriate.
- You will obtain the author's permission before publishing any material from the thesis.

**The development of a whole school approach to education
for sustainability in a primary school**

A thesis

submitted in fulfilment for the degree

of

Doctor of Philosophy

at the

University of Waikato

by

Tatiana Irina Kalnins

University of Waikato

2018



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Abstract

To address environmental and sustainability problems we need a new way of educating our young people; one that provides them with the capabilities and skills to find and examine their own frameworks for solving these problems in the future. Thus, it has been argued that we urgently need to find new models and approaches to education that reflect and contribute to sustainable practices, as traditional educational systems have contributed to the unsustainable conditions we now face. A whole school approach to education for sustainability (EfS) supports the notion that children learn both through an enacted curriculum and informally through the messages and meanings inherent in their surroundings. A whole school approach to EfS involves transforming the system rather than reforming it or simply accommodating change. One school-focussed programme that has been fostering such whole school approaches in New Zealand is the Enviroschools programme. The Enviroschools programme supports a whole centre/school approach to EfS, and describes four key areas of schooling life that have an effect on sustainability and student learning: (1) People (and Participation); (2) Programmes; (3) Practices; and (4) Place.

This thesis has examined the development of a whole school approach to EfS by investigating the planning, implementation and outcomes of such an approach in a New Zealand primary school. An interpretive methodology was used to guide data collection through observations, interviews and analysis of student work as an Enviroschools facilitator worked with the staff and students of the school during their first year of integrating EfS into their school. An analytical framework, based on themes emerging from the 'People, Programmes, Practices and Place' dimensions of a whole school approach to EfS, was used to interpret the data arising from this single, case study school.

This study found that the school leader(s), such as the Principal, have a profound effect on the success of the integration of the whole school approach to EfS. It also found that teacher knowledge and understanding of the complexity of EfS is key to successful integration into the curriculum, with particular emphasis on its trans-disciplinary nature. In addition, special attention needs to be paid to the nature of EfS Facilitation and the interface between EfS theory and practice, for example, how to practically involve the ‘whole school’ in EfS participation.

This research may assist schools in their own EfS journeys by providing insight and clarity around the process of development of a whole school approach to EfS. Detailing the factors that enable and inhibit the development of a whole school approach may provide schools with the direction needed to avoid possible pitfalls, and focus on factors that progress the development of EfS in their school.

Acknowledgements

The completion of this work would not have been possible without the continuous support and understanding of my husband Michael, who has been down a similar academic path himself and understood the value of the work to me.

Thanks are also due to my parents, who tolerated, and even encouraged my childhood obsession with nature and all small things that creep and crawl! That obsession has led to a very great understanding and knowledge in the living world and our place in it.

Unmeasurable thanks are due to my supervisors Dr Chris Eames and Dr Kathy Saunders who never gave up on me despite the many struggles that have occurred along the path to completion. Your support and direction has been vital to the completion of this project. I could not have done it without you.

To our children, Annah and Finlay: this work is for your future.

Table of Contents

| | | |
|----------|---|-----------|
| 1 | Introduction | 1 |
| 1.1 | Background to the study | 1 |
| 1.2 | Education for sustainability | 2 |
| 1.3 | Education for sustainability in New Zealand | 3 |
| 1.3.1 | The Enviroschools programme | 4 |
| 1.4 | A whole school approach to education for sustainability | 6 |
| 1.5 | The process of change - transforming a whole school system | 8 |
| 1.6 | The research objectives and questions | 9 |
| 1.7 | The scope of the study | 9 |
| 1.8 | Overview of the thesis | 10 |
| | | |
| 2 | Literature review – Education for sustainability and whole school approaches | 13 |
| 2.1 | Chapter outline | 13 |
| 2.2 | The development of Education for Sustainability (EfS) | 13 |
| 2.2.1 | The origins of Environmental Education (EE) | 13 |
| 2.2.2 | Origins of the concept of sustainability | 16 |
| 2.2.3 | Education for sustainability | 18 |
| 2.3 | Key concepts within education for sustainability | 19 |
| 2.3.1 | EfS is relevant | 20 |
| 2.3.2 | EfS is holistic | 21 |
| 2.3.3 | EfS is values-oriented | 23 |
| 2.3.4 | EfS is issues-based | 24 |
| 2.3.5 | EfS is action-oriented | 24 |
| 2.3.6 | EfS involves the development of critical thinking skills | 26 |
| 2.4 | EfS in New Zealand | 27 |
| 2.4.1 | The Enviroschools programme | 28 |
| 2.5 | A ‘Whole School Approach’ to EfS | 31 |
| 2.5.1 | Teaching and learning approaches to EfS | 32 |
| 2.5.2 | Characteristics of a whole school approach | 35 |
| 2.5.3 | Orientation of the Enviroschools whole school approach towards EfS | 36 |
| 2.5.4 | Implementation of a successful whole school approach to EfS | 38 |
| 2.5.5 | Evidence in support of a whole school approach to EfS | 40 |
| 2.6 | Chapter summary | 41 |
| | | |
| 3 | Literature Review – Transformative learning and agents for change | 44 |
| 3.1 | Chapter outline | 44 |
| 3.2 | Transformative learning | 44 |
| 3.3 | Transformative learning and EfS | 46 |
| 3.3.1 | Instrumental and emancipatory learning | 49 |
| 3.3.2 | Action competence | 50 |

| | | |
|----------|---|------------|
| 3.4 | The process of change – approaches to transforming a whole system | 52 |
| 3.5 | Agents for environmental change | 58 |
| 3.5.1 | Empowering children to be agents for environmental change | 58 |
| 3.5.2 | Teachers as enablers of environmental change – the role of professional learning in EfS | 61 |
| 3.5.3 | Supporting change – school leadership and EfS | 64 |
| 3.5.4 | Agents of change summary | 68 |
| 3.6 | Chapter summary | 69 |
| 4 | Methodology | 73 |
| 4.1 | Introduction | 73 |
| 4.2 | The research questions | 73 |
| 4.3 | Methodology | 74 |
| 4.4 | Research approaches | 76 |
| 4.4.1 | Case study research | 77 |
| 4.4.2 | Longitudinal studies | 78 |
| 4.4.3 | Ethnographic research and prolonged engagement | 79 |
| 4.5 | Methods of Data Collection and Analysis | 79 |
| 4.5.1 | Observations | 80 |
| 4.5.2 | Interviews | 82 |
| 4.5.3 | Questionnaires | 84 |
| 4.5.4 | Document analysis | 84 |
| 4.5.5 | Data Handling and Analysis | 85 |
| 4.6 | The Research Design | 87 |
| 4.6.1 | The research school | 87 |
| 4.7 | The data collection procedure | 88 |
| 4.7.1 | Outline of the data collection | 90 |
| 4.8 | Trustworthiness: Issues of validity and reliability | 93 |
| 4.8.1 | Qualitative internal validity: the issue of credibility | 94 |
| 4.8.2 | Qualitative external validity: the issue of transferability | 95 |
| 4.8.3 | Qualitative reliability: the issue of dependability | 96 |
| 4.8.4 | Qualitative objectivity: the issue of confirmability | 96 |
| 4.8.5 | Trustworthiness concerns addressed in this study | 97 |
| 4.9 | Ethical considerations | 99 |
| 4.10 | Chapter Summary | 100 |
| 5 | Planning a whole school approach to EfS | 102 |
| 5.1 | Chapter outline | 102 |
| 5.2 | People (and participation) | 102 |
| 5.2.1 | Teacher understanding of the concepts of sustainability and a whole school approach to education for sustainability | 104 |
| 5.2.2 | Leadership and collaboration in the development of a whole school approach to EfS | 107 |
| 5.2.3 | Cultural aspects in the school | 109 |
| 5.2.4 | Action being taken within the school with respect to a whole school approach to EfS | 110 |
| 5.2.5 | Relationships between the school and community | 110 |

| | | |
|----------|---|------------|
| 5.2.6 | ‘People (and participation)’ Summary | 112 |
| 5.3 | Programmes | 114 |
| 5.3.1 | Inquiry learning / Planning an integrated inquiry | 114 |
| 5.3.2 | Planning the curriculum for Term One | 116 |
| 5.3.3 | Teacher views on planning the EfS programmes in their school | 121 |
| 5.3.4 | ‘Programmes’ summary | 125 |
| 5.4 | Practices | 126 |
| 5.5 | Place | 128 |
| 5.6 | Chapter Summary | 129 |
| 6 | Implementing a whole school approach to EfS | 134 |
| 6.1 | Chapter outline | 134 |
| 6.2 | People (and participation) | 134 |
| 6.2.1 | Developing children’s thinking and participation around EfS . | 135 |
| 6.2.2 | Student responses to teacher-led EfS tasks (and discussion) . | 136 |
| 6.2.3 | Professional development around EfS | 138 |
| 6.2.4 | Teacher understanding of EfS | 139 |
| 6.2.5 | The development of teachers’ understanding of EfS and EfS teaching practices | 141 |
| 6.2.6 | ‘People (and participation)’ Summary | 145 |
| 6.3 | Programmes | 147 |
| 6.3.1 | Planning the curriculum for Term Two: EfS as an over-arching framework | 147 |
| 6.3.2 | Action plans and teaching as Inquiry | 149 |
| 6.3.3 | EfS facilitation around tasks in the classroom | 149 |
| 6.3.4 | Student-centred learning | 152 |
| 6.3.5 | Developing student knowledge and understanding | 153 |
| 6.3.6 | Creating a whole school vision map | 155 |
| 6.3.7 | ‘Programmes’ Summary | 164 |
| 6.4 | Practices | 166 |
| 6.5 | Place | 166 |
| 6.6 | Chapter Summary | 167 |
| 7 | Outcomes of a whole school approach to EfS | 172 |
| 7.1 | Chapter outline | 172 |
| 7.2 | People (and Participation) | 172 |
| 7.2.1 | Student understanding of the school vision map | 173 |
| 7.2.2 | Student thoughts on whose ‘job’ it was to look after the environment | 177 |
| 7.2.3 | Student involvement in school decision-making processes . | 180 |
| 7.2.4 | EfS Facilitator views on school leadership and its influence on EfS | 180 |
| 7.2.5 | ‘People (and Participation)’ summary | 183 |
| 7.3 | Programmes | 184 |
| 7.3.1 | Student understanding of the term ‘sustainability’ | 184 |
| 7.3.2 | Teacher understanding of EfS and the term sustainability . | 187 |

| | | |
|-----------------------|---|------------|
| 7.3.3 | Teacher views on EfS teaching approaches and student outcomes | 188 |
| 7.3.4 | Teacher views on the process of a whole school approach to EfS | 190 |
| 7.3.5 | 'Programmes' summary | 191 |
| 7.4 | Practices | 192 |
| 7.4.1 | EfS practices within the school | 193 |
| 7.5 | Place | 194 |
| 7.5.1 | Student views on their school environment | 194 |
| 7.5.2 | Awareness that the environment sustains people and ecosystems | 198 |
| 7.5.3 | 'Place' Summary | 202 |
| 7.6 | Chapter summary | 202 |
| 8 | Discussion and Conclusions | 207 |
| 8.1 | Introduction | 207 |
| 8.2 | Response to research questions | 208 |
| 8.2.1 | Response to question one - How can a whole school approach to education for sustainability be planned in a New Zealand primary school? | 209 |
| 8.2.2 | Response to question two - How was a whole school approach to EfS implemented in a New Zealand Primary school? | 220 |
| 8.2.3 | Response to question three - What were the outcomes of the whole school approach to education for sustainability in terms of student learning, teacher development and school change? | 230 |
| 8.3 | Limitations of the study | 237 |
| 8.4 | Conclusions and implications | 238 |
| 8.4.1 | Planning a whole school approach to EfS | 239 |
| 8.4.2 | Implementing a whole school approach to EfS | 241 |
| 8.4.3 | Outcomes of a whole school approach to EfS | 243 |
| 8.5 | Suggestions and practice for further research | 246 |
| Appendices | | |
| Appendix 1 | Inquiry, co-operative and experiential framework | 248 |
| Appendix 2 | Education for sustainability: Whole school focus | 249 |
| Appendix 3 | Planning an integrated inquiry: Guide and proforma | 250 |
| Appendix 4 | Education for sustainability planning sheet: Planning an integrated inquiry | 254 |
| Appendix 5 | Formal interview schedule: Principal and lead EfS teacher | 262 |
| Appendix 6 | Semi-structured interview schedule: Short interview for teachers | 264 |
| Appendix 7 | Individual written questionnaires: Teachers | 265 |
| Appendix 8 | Formal interview schedule: EfS Facilitator | 266 |
| Appendix 9 | Student focus group semi-structured interview questions | 267 |
| Appendix 10 | Staff focus group questions | 268 |
| Appendix 11 | Environmental action planners | 269 |
| Appendix 12 | Summary of 'Ryelands matters' meeting | 272 |
| Appendix 13 | Ethics letters and consent forms: Adult and student | 275 |

| | | |
|-------------------|---|------------|
| Appendix 14 | Enviroschools action learning cycle | 281 |
| Appendix 15 | Teaching as inquiry | 282 |
| Appendix 16 | Aspects of whole school approaches | 283 |
| References | | 285 |

List of Tables

| | | |
|-----|--|-----|
| 4.1 | Timeline of data collection at Ferndale School | 89 |
| 5.1 | EfS Enablers and inhibitors to the whole school approach during the planning phase | 130 |
| 6.1 | Ferndale School vision PMI student response themes for school vision map, March 2009 | 158 |
| 6.2 | Student responses to questions provided by EfS Facilitator in preparation for developing a school vision map | 161 |
| 6.3 | EfS Enablers and inhibitors to the whole school approach during the implementation phase | 168 |
| 7.1 | Year 5 and Year 6 student response themes on their school vision map | 174 |
| 7.2 | EfS Enablers and inhibitors to the whole school approach during the outcomes phase | 203 |

Chapter 1

Introduction

1.1 Background to the study

My interest in Education for Sustainability (EfS) stems from a childhood fascination in the small animals in my local environment, particularly the stream in the gully in my urban Hamilton garden, and the rocky shores of a nearby beach on the west coast of the North Island. My early experiences in the environment, the influence of a parent who had a strong background in the sciences, and a great curiosity in the living world led me to study biology and animal behaviour to Masters level at the University of Waikato.

Whilst studying at university I became interested in the processes of teaching and learning, and after completing my Master of Science degree I enrolled in a graduate teaching diploma in secondary science and biology. Following the completion of the teaching diploma, I spent approximately seven years as a day relief teacher at the Year 6 to Year 8 level in local schools, and teaching art to both children and adults through an independent organisation in Hamilton. During this time spent with young people it became increasingly apparent to me that areas of learning such as education relating to sustainability, and the environment in general did not feature greatly, if at all, in many school practices. Additionally, time spent with our own two young children on our rural property made me consider how their developing values relating to the environment could be affected by the values promoted by future schooling practices.

I considered the general lack of learning opportunities around sustainability and the environment to be a problem because I felt that children were not being adequately prepared for living in a world where making sustainable choices was becoming increasingly important. It has become increasingly apparent that current ways of life, both in New Zealand and around the world, cannot be sustained indefinitely, and it seemed as if many of the current schooling practices were essentially perpetuating the same attitudes and values that had created many of the

environmental and sustainability issues that face us today. I felt that schools were in an ideal position to contribute to the transformation of people's worldviews towards that of sustainability and the empowerment to drive change towards a sustainable future. Finding myself to be becoming increasingly interested in sustainability and its apparent lack of presence in New Zealand primary schools, I decided to return to university and involve myself with further research relating to EfS.

1.2 Education for Sustainability

Education for Sustainability, or 'EfS', has its origins in environmental education. As a concept, EfS has evolved from the concept of care and concern for the natural environment, towards a broader, more holistic view, which includes sustainability from not only a biological view of the bio-physical environment but also social, economic and political aspects.

The concept of sustainability can be thought of as:

an unending quest to improve the quality of people's lives and surroundings, and to prosper without destroying the life-supporting systems that current and future generations of humans (and all other species on Earth) depend on.

(Parliamentary Commissioner for the Environment [PCE], 2004, p.14)

Definitions of education for sustainability and education for sustainable development are debated throughout the literature. Despite this, there is a common commitment to increase knowledge, and engage people in and change their actions, values, and attitudes towards that of sustainable environmental and social management (Shallcross, Loubser, le Roux, O'Donoghue & Lupele, 2006; Tilbury, 1995). EfS is generally regarded as learning how to make decisions and take action that considers the long-term future of the environment, economy and social justice of communities (Wooltorton, 2004).

Internationally, EfS has been mainly coordinated and driven by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) for over 30 years (Wooltorton, 2004). UNESCO's priority has been to reorient education

towards sustainability, and the organisation states that the current human and ecological crises are the symptoms, not the causes, of our current social, economic and political practices (UNESCO, 2002). UNESCO (2002) proposes pillars of sustainability that are grounded in the following interdependent systems: biophysical, economic, social and cultural, and political.

EfS is a broad-based, futures-focused approach to human development and utilisation of resources (Tilbury, 1995). As a concept, it looks at individual and systemic changes that are needed to resolve unsustainable practices. Education for sustainability needs people and organisations to see that they can make changes towards sustainability, and to understand that many systems and practices will need to be transformed in order for future generations to achieve a good quality of life (PCE, 2004).

1.3 Education for sustainability in New Zealand

While EfS is currently not compulsory in New Zealand schools, the Ministry of Education recognises that students should be encouraged to value ‘ecological sustainability’ and care for the environment (Ministry of Education [MoE], 2007). Elements of EfS can be found in the science ‘strand’ of the *The Zealand Curriculum* (MoE, 2007), e.g. the idea that people are guardians of our finite resources, that a knowledge of chemistry allows students to be better able to understand science-related challenges such as environmental sustainability, and that people can affect the interdependent nature of the physical and living world in both positive and negative ways. EfS is also present: in the social science strand of *The New Zealand Curriculum* (MoE, 2007), e.g. students should be given the opportunity to learn about the relationships that exist between people and the environment; in the technology strand, e.g. technology is influenced by and in turn impacts the environmental conditions of the day; and also in the health and physical education strand, where students are encouraged to develop attitudes and values of respect, care and concern for the environment (MoE, 2007). The Ministry of Education in New Zealand has also produced guidelines for schools interested in integrating EfS into their curriculum (MoE, 1999), and also provided resource material aimed at supporting EfS at the senior secondary level (MoE,

2017). The former guidelines use the term ‘Environmental Education’, but are, in essence, describing EfS. The guidelines have provided the following definition of Environmental Education (or EfS, as I shall refer to it from this point in the thesis) for teachers: “Environmental education is a multi-disciplinary approach to learning that develops the knowledge, awareness, attitudes, values, and skills that will enable individuals to contribute towards maintaining and improving the quality of the environment” (MoE, 1999, p. 9).

Key concepts in EfS that are globally recognised, such as interdependence, sustainability, biodiversity and personal and social responsibility for action, are outlined in the guidelines. Education ‘in, about and for’ the environment is also recognised. These guidelines describe five aims of EfS which relate to awareness and sensitivity to the environment and related issues; knowledge and understanding of the environment and the impact of people on it; attitudes and values that reflect feelings of concern for the environment; skills involved in identifying, investigating and problem solving associated with environmental issues; and a sense of responsibility through participation and action (MoE, 1999, p.9). These aims are in alignment with EfS practices around the world (Barratt-Hacking, Barratt & Scott, 2007; Erturk-Kara, Aydos & Aydin, 2015; Silo, 2013).

In spite of EfS having a presence in *The New Zealand Curriculum* (MoE, 2007), it may not feature in many schooling practices (Eames et al., 2008). One programme which has sought to bring EfS to schools is the Enviroschools programme, which exists to help schools in their EfS journeys with practical assistance from facilitators and detailed guidelines.

1.3.1 The Enviroschools programme

The Enviroschools programme in New Zealand is supported by a national team, with nearly 100 national and regional partners, including the majority of New Zealand’s local and regional councils. The programme began in 1993 as a partnership between Hamilton City Council (HCC), Environment Waikato (now called Waikato Regional Council), known as The Community Environmental Programme (CEP), with 3 schools looking at how Environmental Education could

be integrated into school life. The Enviroschools Foundation was established in 2003, and partnerships with councils across the country supported facilitators to be trained and schools to sign up to participate in the Enviroschools programme. An Enviroschools Awards scheme was later introduced which offers Bronze, Silver and Green-Gold levels to schools which reflects the 'level' of their Enviroschool sustainability practices (Enviroschools, 2017).

Facilitators from these partner organisations work with a range of resources, including an *Enviroschools Kit*, to assist schools on their sustainability journeys. The Enviroschools programme assists children and young people in planning, designing and implementing sustainability actions that are important to them and their communities. The aim of the programme is to foster a generation of people who instinctively think and act sustainably (Enviroschools, 2016).

Every 'enviroschool' (i.e. a school that undertakes to integrate EfS into its systems with the guidance of an EfS Facilitator) follows a unique journey that develops from small beginnings and gathers strength and breadth along the way; empowers people of all ages; builds sustainable communities; integrates sustainability into the curriculum; is grounded in Māori perspectives; recognises cultural diversity; and engages in the physical, social, cultural and political aspects of the environment and builds towards a whole-school approach (Enviroschools, 2016).

The Enviroschools programme describes four key areas of schooling life that have an effect on sustainability and student learning:

1. **People (and Participation):** Decisions and actions are made with the involvement of students, staff and other members of the community.
2. **Programmes:** Sustainability is a core part of the formal curriculum, it underpins integrated programmes.

3. **Practices:** Policies and systems support environmentally friendly and sustainable practices, which are monitored and evaluated, to document progress being made towards sustainability.
4. **Place:** The buildings and grounds are designed to work with natural systems, and reflect the culture and heritage of the place.

(Enviroschools, 2016)

These four aspects described by the Enviroschools programme aim to integrate EfS into all aspects of schooling life, in other words, the ‘whole school’. The principle of a ‘whole school approach’ to EfS is described in the following section.

1.4 A whole school approach to Education for Sustainability

It is becoming increasingly apparent that many current methods of resource use and human development will not be sustainable into the future (Bolstad, 2003). It has also been argued that traditional educational systems based around teaching pre-determined content knowledge in a transmissive manner are continuing to further the industrialisation of the planet (Sipos, Battisti & Grimm, 2008; Sterling, 1996). We urgently need to find new models and approaches to education that allow the development of critical thinking and action competence, key aspects of a transformative educational concept such as EfS (Birdsall, 2010).

Sustainability issues are embedded in all aspects of our lives – natural, technological, cultural and social. A whole school approach to Education for Sustainability (EfS) recognises that children have the capacity to learn informally through the messages and meanings inherent in cultural surroundings such as in their school (Hamilton City Council, 2001; Higgs & McMillan, 2006). A school can have a powerful role in shaping the attitudes, values and actions of its students towards a sustainable future through the informal or 'hidden' curriculum (Davis & Cooke, 2007; Lynagh, Schofield, & Sanson-Fisher, 1997). A whole school approach to EfS requires the participation of the whole school and its community

in order to maximize the sustainability outcomes (Davis & Cooke, 2007; McKeown & Hopkins, 2007).

The role of many schools in New Zealand at present is one of social reproduction and there is a tightly prescribed focus on literacy, numeracy and assessment with little time given to subjects outside these areas (Birdsall, 2010). This approach to education has perpetuated the values that have furthered the deterioration of the natural world and consumption of resources (Sipos, Battisti & Grimm, 2008; Sterling, 1996). Many current teaching methods reflect the dominant cultural norms of individualism, competition and independence, (Birdsall, 2010).

Transformative learning is an overarching concept that aims to develop critical thinking skills (Cranton, 1994; Merriam & Ntseane, 2008; Merriam, 2004; Nazzari, McAdams & Roy, 2005) and empower students to challenge existing assumptions (Merriam & Ntseane, 2008; Merriam, 2004; Sipos et al., 2008). Critical reflection occurs when individuals look back on prior learning and focus on assumptions about the content of the problem, the process followed in problem solving, or the pre-suppositions on the basis of which the problem has been founded (Mezirow, 1990). Critical reflection is essential to transformative learning, and prompts processes of reconstructing knowledge based on life experiences which may help people develop new ways of thinking and being (Merriam & Ntseane, 2008; Merriam, 2004; Sipos et al., 2008).

In order to help people develop attitudes and values that promote a sustainable existence, the purpose of education needs be to *transform* society towards a more sustainable future by encouraging and imparting goals that contribute to sustainability (Arlemalm-Hagser & Davis, 2014; Bolstad, 2003; Davis & Cooke, 2007; Dymont & Hill, 2015; Huckle & Sterling, 1996; Sterling, 2001). Sustainability education pedagogy is viewed as transformative, and the learning is holistic and open-ended. Students are encouraged to critically examine their current patterns of behaviour and their effects on the environment, suggest alternatives and make changes (Birdsall, 2010). Transformative education also uses a constructivist pedagogy in which students actively construct and

reconstruct knowledge, transforming meanings to arrive at new understandings and different ways of thinking (Share, 2007).

Two approaches to learning in EfS have been described by Wals, Geerling-Eijff, Hubeek, van der Kroon & Vader (2008): instrumental and emancipatory. The instrumental approach aims to improve peoples' understanding of sustainability issues by influencing their behaviour and awareness through campaigns and activities that have specific objectives (Wals et al., 2008). The emancipatory approach, attempts to engage people in active communication in order to establish long-term changes relating to public support, engagement and involvement (Wals et al., 2008).

1.5 The Process of Change – transforming a whole school system

As has been mentioned earlier in this introduction, EfS may not have a strong presence in many New Zealand Schools (Eames et al., 2008). In order to successfully integrate EfS, a school needs to embark on a whole school transformation from current practices towards that of embedded sustainability. The process of transforming a school system requires designing and implementing an entirely new paradigm of education (Reigeluth, 2006). One of the many challenges faced by systems that want to make major changes in their educational practices is the difficulty of dealing with the current beliefs, values, and attitudes of those involved (Forlin, 2007).

Within a school system there are a number of potential agents for environmental change. The students can be empowered to be agents of change by developing knowledge relating to sustainability and participating in active learning experiences. Professional learning and development for teachers can assist them to become agents of change in the classroom, and school leaders, the principal in particular, can support and drive change.

This thesis then examines how change could be brought about through a transformative process of education for sustainability using a whole school approach.

1.6 The research objectives and questions

The aims of this study were to examine in detail the development of a whole school approach to EfS in a primary school. Specifically, the following objectives for the study were:

- 1) To identify the characteristics of a whole school approach to education for sustainability.
- 2) To evaluate the process of development of a whole school approach to education for sustainability, over a given period of time.
- 3) To determine if the development of a whole school approach to education for sustainability has an impact on student learning, teacher development and school change.

In order to address these objectives, I posed the following questions for my inquiry:

- 1) How can a whole school approach to EfS be planned in a New Zealand primary school?
- 2) How was a whole school approach to EfS implemented in a New Zealand Primary school?
- 3) What are the outcomes of the whole school approach to education for sustainability in terms of student learning, teacher development and school change?

1.7 The scope of the study

The study was limited to a case study involving one research school, to be known in this thesis as Ferndale School (a pseudonym). This school was selected for my research because it was in the very early stages of integrating EfS, and thus was a

suitable candidate for studying the development of a whole school approach to EfS. The school was rural and had four classrooms only. The grounds in general were relatively un-developed.

There were about 80 students at the school at the time of the study, ranging in age from Year 0/1 (five year olds) to Year 6 (10 year olds). The school was decile-rated level 6 (a measure of socio-economic rating of the community), and was made up of roughly 40% NZ European, 46% Maori/Pacific Island and 14% other ethnicities (www.educationcounts.govt.nz).

Ferndale School had four full-time teachers at the time of the study, two or three support staff, and a principal. Each of the four teachers taught a mixed level class. An EfS Facilitator, who visited the school regularly during the first year of integration also participated in the study at the planning stage. The school had not participated in any EfS before the year this study was undertaken. Some staff had undertaken limited professional development in EfS.

1.8 Overview of the thesis

This thesis is organised into a further seven chapters. A brief outline of each chapter follows:

Chapter 2 reviews the literature relevant to the origins, development and aims of environmental education (EE), and provides a description of how EE evolved into EfS. The position of EfS in New Zealand schools is reviewed, and the Enviroschools programme is outlined. The concept of a Whole School Approach to educational systems is discussed, in both general and EfS terms.

Chapter 3 reviews the literature surrounding theories of change. Transformative learning, instrumental and emancipatory learning and action competence are reviewed in the context of EFS. The process of change, and approaches and challenges to implementing a whole school system are discussed. Agents for environmental change, such as students, teachers and school leaders are also examined in the context of a whole school approach to EfS.

Chapter 4 provides a description of how the research in the study was conducted. It provides background to the methodological approach used in the research, and the methods chosen for data analysis and collection. It also includes a description of the research design, including sampling, data collection and analysis, and discusses the issues of trustworthiness and ethics.

Chapter 5 presents the data drawn from observations of meetings with the teaching staff and the EfS Facilitator, and individual formal interviews with the principal, lead EfS teacher and EfS Facilitator during the planning stage of the development of the whole school approach to EfS. The data chapter is subdivided into four key areas of school life that may have an effect on student learning, teacher development and school change in EfS: (1) People and Participation; (2) Programmes; (3) Practices; and (4) Place (Enviroschools, 2014). A narrative analysis was constructed by identifying emergent or key themes in the data from each of these four key areas (Cohen, Manion and Morrison, 2011).

Chapter 6 presents the data drawn from observations of meetings with the teaching staff and the EfS Facilitator, and individual formal interviews with the principal, lead EfS teacher and EfS Facilitator during the implementation phase of the development of the whole school approach. As in Chapter 5, the data chapter is subdivided into four key areas of school life that may have an effect on student learning, teacher development and school change in EfS: (1) Programmes; (2) People and Participation; (3) Practices; and (4) Place (Enviroschools, 2014). A narrative analysis was again used.

Chapter 7 presents the data drawn from observations of meetings with the teaching staff and the EfS Facilitator, individual staff questionnaires, staff interviews and student semi-structured interviews from the latter part of the year, after EfS had been in the process of integration for at least seven months. Although the integration of EfS into the school did not occur in a linear fashion, and the planning, implementation and outcomes phases were not mutually exclusive, the last three or four months of the first year of EFS integration were considered a reasonable, if arbitrary, point at which one could consider what the outcomes of the whole school approach were so far. As for the previous two data

chapters, chapter 7 is again subdivided into four key areas of school life that may have an effect on student learning, teacher development and school change in EfS: (1) Programmes; (2) People and Participation; (3) Practices; and (4) Place (Enviroschools, 2014).

Chapter 8 presents the conclusions and implications drawn from the research and presents suggestions for further practice and research.

Chapter 2

Literature Review –

Education for sustainability and whole school approaches

2.1 Chapter outline

This chapter presents an argument for the relevant literature for the thesis. The literature review begins with the origins, development and aims of environmental education (EE), and a description of how EE evolved, through changes in understanding, towards EfS. The position of EfS in New Zealand schools is reviewed, and the concept of the Enviroschools programme, and its links to EfS is outlined. The concept of a Whole School Approach (WSA) to educational systems is discussed, in both general and EfS terms.

2.2 The development of Education for Sustainability (EfS)

EfS has its roots in environmental education. As a concept, EfS has evolved from the concept of care and concern for the natural environment, towards a broader, more holistic view that includes sustainability of not only the biological and bio-physical environment but also social, economic, political, biological and physical aspects. In order to better understand the position of EfS today, it is useful to review the origins of modern, Western, societal viewpoints, the origins of EE and the drivers behind its metamorphosis into EfS over time.

2.2.1 The origins of Environmental Education (EE)

Over the last 300 years the pre-existing world view that all living things were interconnected has largely been replaced by a mechanistic and scientific world view which sees the Earth as an object and nature as a machine that is available for transformation according to human interest (Huckle, 1996). The modern (Western) world as we know it has its origins in seventeenth century Europe when the end of feudalism and the rise of capitalism saw the enclosure of much

common land and the break-up of the social institutions that had ensured its cooperative and sustainable use. Land became a source of private income and nature was increasingly treated as a commodity. The concept of capitalism required economic growth and has the inherent tendency to exclude present and future environmental costs. The need to sustain capital accumulation and the living standards of the majority often restricts moves towards more sustainable forms of development (Huckle, 1996).

The prevalent understanding of the world is primarily reductionist rather than holistic – the world is seen as if it were divisible, simple and separable, rather than complex and interconnected (Sterling, 2010). This perception of, and belief in, separateness may well render our worldview increasingly inappropriate (Bateson, 1972, as cited in Sterling, 2010). It is one thing to *differentiate* between, for example, nature and culture, whilst creating some order of understanding, but quite another to *dissociate* them from each other and their interconnectedness (Sterling, 2010). The human mind creates mental constructs: we ‘bound’ our understanding, rather than seeing issues in terms of dynamic relation and interconnection. It has been suggested that this ‘problem’ of bounding our understanding has extended to our educational systems and also to the educational movements that have emerged, apparently to address the environmental issues that face us, many of which may arise from a dissociative mindset. When looking at the history of educational movements, it is possible to discern two, apparently contrary but simultaneous trends, one of increasing inclusivity and the other of increasing fragmentation (Sterling, 2010). These changes in educational movements have had an impact on the development of EE, and subsequently of the nature of EfS and the understanding of the concept of sustainability.

The development of EE is connected to increasing international social concern for the environment and corresponding political change (Bolstad, 2003; Tilbury, 1995). Aspects of EE can be traced to rural and local studies in the North America and Europe in the 1960s (Hart, 1997; Sterling, 2001). During the 1970s and 1980s there was an increasing level of concern about human degradation of the environment (Bolstad, 2003), and the boundaries of what was understood by the term ‘environmental education’ broadened and became more inclusive

(Sterling, 2010). In the 1970s, EE made a stronger appearance, embracing urban issues, and ethical and political dimensions. Also, during this time it became clear to environmentalists and scientists that existing methods of resource use and human development could not be sustained into the future. In 1977, Tbilisi (USSR) hosted the world's first Intergovernmental Conference on Environmental Education, putting EE into the global spotlight (Bolstad, 2003). During this landmark event a global framework, and principles and guidelines for EE were established. The *Tbilisi Declaration* established three main goals for EE: (1) To make people aware of, and concerned about, economic, social, political and ecological interdependence in urban and rural areas; (2) To provide every person with the opportunity to develop the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment; and (3) to create new patterns of environmentally thoughtful behavior in people (UNESCO-UNEP, 1977). As a part of this, five educational objectives were outlined as being essential for EE – awareness, knowledge, attitudes, skills and participation (Bolstad, 2003).

During the 1980s public concern for the environment increased, resulting in EE having a stronger presence in schools (Tilbury, 1993). During this time there was a realisation that in fact EE required a more multi-disciplinary, global approach, in other words, a holistic outlook (Tilbury, 1993). The term 'EE' expanded to include environmental studies and field studies, environmental science, environmental interpretation, urban studies, heritage education, conservation education, and global environmental education, where different interests promoted different aspects, often through separate organisations and groups (Sterling, 2010). Simultaneously, the boundaries of EE started to lose definition and became gradually more permeable and inclusive (Sterling, 2010). Within this apparent fragmentation there was a growing sense of commonality, of parts within a greater whole: the growing equation of 'environment' and 'development' meant that the two parallel educational movements inevitably became more closely associated (Sterling, 2010). The focus of EE at the time could be seen as promoting 'negatives', such as *stopping* pollution or *stopping* using non-renewable resources, and thus it was not necessarily encouraging pro-active behaviour towards shaping a future that was both 'environmentally friendly', and

simultaneously allowing for people to develop and maintain social, political and economic relations (PCE, 2004).

Through the 1990s public environmental concern continued to increase and expand its focus. Other movements of education for change appeared, in particular education for sustainable development.. The Brundtland Commission (1987, p. 8) defined sustainable development as behaviour that "meets the needs of the present without compromising the ability of future generations to meet their own needs" At the same time, a series of parallel movements concerned with education for relevance and social change developed and there was increasing recognition by practitioners that their concerns were mutual and relative (Sterling, 2001). The general greater awareness of the increasing social and environmental problems the world was facing, and the subsequent challenge of sustainability, led the way to the coining of the term education for sustainability, which can be seen as a catch-all term which includes traditional EE concepts in addition to education for societal change towards sustainability (Sterling, 2001). The term "sustainability" first appeared in the 1980's through the *World Conservation Strategy* (IUCN/UNEP/WWF 1980). This was later reinforced by the *Bruntland Report* (World Commission on Earth and Development, 1987). EfS was firmly supported by the *1992 Summit* (the *UN Conference on Environment and Development*, or *UNCED*), specifically by *Agenda 21*, which focused on the re-orientation of EE towards sustainability, i.e. towards EFS (Tilbury, 1995).

2.2.2 Origins of the concept of sustainability

Sustainability has no single and agreed meaning (Huckle, 1996). It takes on different meanings within different social systems. These systems are in turn underpinned by different kinds of knowledge, values and philosophy. A key function of education for sustainability is to help people reflect and act upon these meanings and so create alternative futures in more informed and democratic ways (Huckle, 1996).

Sustainability can be thought of as:

an unending quest to improve the quality of people's lives and surroundings, and to prosper without destroying the life-supporting systems that current and future generations of humans (and all other species on earth) depend on.

(PCE, 2004, p.14)

The origins and historical development of the concept of sustainability can be linked to the spread of modernity and its impact on people's lives and the environment, and the growth of environmental science and managerialism (Huckle, 1996). Sustainability provides a bridge between development and environment groups, which subsequently produces disagreements between scientists and social scientists regarding the relative importance of the natural world and the social world respectively.

Due to the continuing power of liberal capitalism and its supporters, most of the world currently lacks forms of government that are concerned with regulating economic production and social reproduction in ecologically and socially sustainable ways. Global environmental governance has emerged in the form of declarations, policies and agreements from numerous world conferences primarily taking place in the United Nations conferences.

The UN Conference on the Environment and Development (UNCED) held in Rio de Janeiro in 1992 aimed to extend the pre-existing framework of international law to include our common rights and duties with respect to the Earth's natural resources. The conference issued a declaration setting out the principles defining these rights and responsibilities, agreed legally binding treaties on biodiversity and climate change, and endorsed *Agenda 21*, which outlined the actions needed by societies, at all levels, to allow the transition to sustainable development (UNCED, 1992). The Rio conference examined issues raised by the Brundtland Commission (the World Commission on Environment and Development) which identified unequal development as the primary cause of environmental problems and recommended the revival of economic growth combined with a change in its quality (Huckle, 1996). However, its attempts to reconcile the environment and

development had limited success as UNCED moved away from the poor and the need for a new international economic order. It is at the local level that programmes of sustainable livelihood are most likely to emerge and grow as a large amount of the statements in *Agenda 21* cannot be delivered without the cooperation and commitment of local government (Hart, 1997; Huckle, 1996).

The World Summit on Sustainable Development in Johannesburg, 2002, confirmed the need to re-direct the role of education towards that of sustainability (Holdsworth et al., 2008). As a result of this and other conferences, the UN initiated the Decade of Education for Sustainable Development (UNDESD) (2005-2015). The focus of this decade was to have all educators include sustainable development concepts and aims in their curriculum (Holdsworth et al., 2008). Despite this, it has been claimed that the integration of EfS into the educational system has been extremely slow to permeate current practices (Holdsworth et al., 2008)

2.2.3 Education for sustainability

Definitions of education for sustainability and education for sustainable development continue to be contested and debated throughout the literature. However, despite this, there is a common commitment to increase knowledge, and engage people in and change their actions, values, attitudes towards that of sustainable environmental management (Shallcross et al., 2006; Tilbury, 1995). In light of this, I will use the term education for sustainability, or EfS, as often as appropriate for consistency.

EfS is generally regarded as learning how to make decisions and take action that considers the long-term future of the environment, economy and social justice of communities (Wooltorton, 2004). EfS is, and was historically, applied in schools through an environmental education approach. On an international level, EfS has been primarily coordinated and driven by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) for over 30 years (Wooltorton, 2004). UNESCO's aim is to transform educational systems towards that of sustainability, and considers that the current human and ecological crises are the symptoms, not the causes, of our current social, economic and political practices

(UNESCO, 2001). UNESCO (2002) proposed four pillars of sustainability which aim to underpin EfS and which are grounded in the following interdependent systems: biophysical, economic, social and cultural, and political.

In order to effectively address our social and environmental problems we need alternative new way of educating our students; one that provides them with the capabilities and skills to find and examine their own frameworks for thinking to solve problems. Education for sustainability requires the development of these skills and competencies, and thus differs from traditional pedagogical approaches which may not support the development of skills that underlie EfS, such as critical thinking and action competence. The concept of education for sustainability (EfS) is the result of a shift in thinking from the traditional environmental education views towards sustainable practices within our environmental, economic, social and cultural practices (PCE, 2004; Wooltorton, 2004). The term ‘paradigm shift’ may be used to describe the transformation needed to sufficiently address issues of sustainability. EfS provides transformative learning opportunities that encourages individuals to develop critical thinking skills and realise the implications for a more sustainable way of living (Holdsworth, 2008). Specifically, EfS needs to be incorporated into daily activities in an interdisciplinary and intercultural setting (Fien, 2001) and should not be an add-on class in a traditional school setting.

2.3 Key concepts within education for sustainability

Education for sustainability is inherently founded on the notion of social change, comprising a number of concepts, including citizenship, peace, health, and multiculturalism (Huckle & Sterling, 1996). It also includes central themes concerned with addressing the integration of knowledge, critical thinking, values analysis, skills development and active citizenship (Huckle & Sterling, 1996). Education for sustainability is concerned with identifying and advancing the kinds of education, teaching and learning policy and practice that appear to be required if we are intent on ensuring social, economic and ecological viability and wellbeing, both now and into the future (Sterling, 2014). Sustainable education implies that educational thinking and practice will be sustaining, tenable, healthy

and durable. It will help sustain people, communities and ecosystems. It is ethically defensible, demonstrating integrity, justice, respect and inclusiveness. Sustainable education is itself an adaptive, viable system embodying and nurturing healthy relationships and different system levels. Sustainability education needs to be durable, it should work well enough in practice to be able to keep doing it (Sterling, 2010).

EfS is a broad-based, futures-focused approach to human development and utilisation of resources (Tilbury, 1995). It looks at individual and systemic changes that are needed to resolve unsustainable practices. Education for sustainability will require people and organisations to see that changes towards sustainability can be made, and that many systems and practices will need to be transformed in order for future generations to achieve a good quality of life (PCE, 2004). Tilbury (1995) suggests that EfS can be outlined according to the six key concepts outlined in the following subsections:

2.3.1 EfS is relevant

The transfer of knowledge and values from the learning environment to the student's everyday life should occur if students see it as being relevant to everyday life. However, it has been found that EE concepts/skills that are apparently "learnt" in a classroom, or other learning environments, are not necessarily seen as applicable to life outside that situation (Ballantyne & Packer, 2005). Ballantyne, Fien & Packer (2001) found mixed results regarding the transfer of knowledge from the learning experience to the home environment. They concluded that a number of factors may influence the transfer of knowledge:

- providing an enjoyable experience
- connecting with the age and interests of the group
- providing adequate support for learning
- liaising with students' parents
- emotionally engaging students in environmental issues.

(Ballantyne et al., 2001)

Integration of EE throughout the whole school is viewed by some schools as being important, as it allows for more cohesive unit planning (Eames & Cowie, 2004), and provides mutual support for staff. A whole-school approach may also be of assistance when teaching students the importance of sustainable practices in “everyday life”. Students are able to learn informally through the messages and practices that they encounter in all aspects of their school’s operations (Hamilton City Council, 2001 as cited in Bolstad, 2003). As a result of this, they may possibly see sustainable practices as ‘the norm’ rather than the exception.

EfS is future oriented and encourages pro-active behaviour towards sustainability. Thus people are given the opportunity to create the future they want to live in (PCE, 2004; Woollorton, 2004).

2.3.2 EfS is holistic

As a result of continued discussion about how to approach EfS in the classroom, researchers have agreed that it needs to be taught *holistically* (Bolstad, Cowie & Eames, 2003). This could occur through *experiential learning* – a popular theory of learning in EE that proposes that a holistic response (i.e. applying all faculties simultaneously) to a problem is normal when people find themselves in a complex dilemma (such as an environmental issue) (Barker & Rogers, 2004; Barrett, 2006).

It is important to keep classroom lessons balanced in proportions of activities *in, about* and *for* the environment. Artificially separating activities and only teaching lessons, for example, *for* the environment, defeats the purpose of holistic teaching, which requires that individuals to apply multiple levels of thinking and knowledge to a problem (Barker & Rogers, 2004).

Research has shown that despite the provision of Environmental Education guidelines in New Zealand schools (Ministry of Education, 1999), many teachers still possess misconceptions about what education *for* the environment actually is (Barker & Rogers, 2004; McLean, 2003).

Prompted by this, Barker and Rogers (2004) proposed a three-way categorisation of student activities *for* the environment:

1. Formative experiences
 - Teacher centred with minimal student consultation.
 - Includes learning experiences such as tree planting and cleaning up a beach.
 - Activities focus on the symptoms, not the causes of environmental issues.

2. Emerging skills and attitudes
 - Activities are still primarily teacher-directed, but there is increased student decision-making and skill development.
 - Types of activities include stream surveying and sampling biodiversity on a rocky shore.
 - Activities are topic based rather than issue based, and avoid asking: “What can we do about the issue?”

3. Embedded for
 - Students have a significant role in decision-making and action regarding an EE issue.
 - Types of activities include planning and planting an edible garden at school (whilst taking into account the needs of future students), discussion and investigation of an environmental issue by writing letters and creating a submission that initiates a change.
 - Due to the large scale of such activities, it is likely that the action will actually be embedded in an evolving situation, or classed as an indirect action (Jensen & Schnack, 1997).

Note that the first two categories of lesson implementation describe activities, not actions, whereas the third category describes actions, not activities (Jensen & Schnack, 1997).

The development of children's capacity to participate in *actions for* the environment has been described by Hart (1997). From the age of four to 12 years and older, children are able to move from simple domestic environmental management, to local and community-based projects, and then strategic ecological research (Hart, 1997). As children develop, so too does their social and ecological understanding, political awareness, empathetic and moral development, and access to, and interest in, environmental issues (Hart, 1997). Knowledge of this allows an age-appropriate EE plan, including balanced proportions of education *in, about* and *for* the environment to be developed both horizontally across a year, and vertically through Y1-8.

2.3.3 EfS is values-oriented

Values education is an integral part of EE (Tilbury, 1995). Traditionally, the role of schools has been seen to be one of social reproduction, where each generation learns the same societal values (Bolstad, 2003). However, if we are to change our methods of development such that we can maintain a sustainable existence, then the purpose of values education should be to *transform* society towards a more sustainable future (Bolstad, 2003).

In discussion of this point, Lucas (Lucas, 1979 as cited in Gough, 1997) argues that a teacher does not have the right to impose their own personal value system in such a way that the student becomes indoctrinated to their views. In other words, we should not view values education as *message transmission*, but rather as *meaning taking/making* (Ballantyne & Packer, 2005). This allows for people to construct their own meaning from the learning experience based on their prior experiences and knowledge (Gough, 1997; Ballantyne & Packer, 2005). Factors that are more likely to induce a values shift are those that challenge and activate the learner's emotions (Ballantyne & Packer, 2005). Learning experiences that offer more scope for values change are those which present a variety of views (e.g. different ethnic or political views), and challenge the learner to explore other ideas, experiment and draw conclusions (Ballantyne & Packer, 2005).

2.3.4 EfS is issues-based

The aim of EE is to involve students in environmental issues, either real or simulated (Tilbury, 1995). In the context of an environmental issue, the student is required to consider facts, values and morality, i.e. approach the issue ‘holistically’ (Tilbury, 1995).

Issues can be either:

1. Local - e.g. conserving energy and reducing solid waste.
2. National - e.g. managing land and water resources.
3. Global - e.g. population control and climate change.

(MoE, 1999)

2.3.5 EfS is action-oriented

Problems with the traditional EE approach is that simply educating people for environmental awareness has not resulted in their taking action towards the resolution of any EE issues (Barrett, 2006). Individuals taking informed action to address issues of sustainability and participate in creating a sustainable future is the core of EfS (MoE, 1999; MoE, 2017; Tilbury, 1995). Sustainable ‘actions’ that many schools participate in may include recycling, worm farming, gardening and composting (Eames, Law, Barker, Iles, McKenzie, Patterson, Williams, Wilson-Hill, Carrol, Chaytor, Mills, Rolleston & Wright, 2006). Whilst such actions may be considered to be actions ‘for’ the environment by many teachers (Eames et al., 2006), the drivers behind the student actions, and the understanding on the part of the participants regarding the why they are doing the action ultimately may determine whether such behavior is behavior change or leading to action competence.

Behaviour change resulting in sustainable action can be brought about by instrumental means, such as imposing laws, offering rewards and issuing punishments, and conditioning of behavior (Wals & Jickling, 2002). This ‘eco-totalitarian’ approach (Wals & Jickling, 2002, p.224) may result in people acting

sustainably, but may not be the most socially just approach, or in fact allow citizens to develop resilience to changing circumstances with respect to sustainability. What may be required in terms of sustainable actions can vary from place to place, and can also vary over time.

A more emancipatory approach to taking sustainable action works towards developing citizens who are operating beyond behavior change at the individual level: they recognize the social and political context within which sustainability attitudes are formulated and actions undertaken (Uzzell, 1999; Wals & Jickling, 2002). In an emancipatory approach to taking action for sustainability, citizens actively and critically participate in problem solving and decision-making, and value and respect alternative ways of thinking, valuing and doing (Wals & Jickling, 2002). This process of individuals taking sustainable action develops action competence (Bolstad, 2003; Jensen & Schnack, 1997; MoE, 2017).

Jensen and Schnack (1997) define *action competence* as being the ability and willingness to be an active participant in an environmental issue. The term *action* differs from activity by way of addressing the root cause of the sustainability issue, not merely addressing the symptoms, and encompasses a range of aspects, from behaviour, movements, habits and actual “actions” (Jensen & Schnack, 1997). Action competence may be best developed through education that focuses on students being involved in the decision-making processes and resolution of issues that are relevant to them (Barrett, 2006; Shallcross et al., 2006; Eames et al., 2006).

In EfS there are six aspects that are considered to work together to support the development of student action competence:

- Experience
- Reflection
- Knowledge
- Visions for a sustainable future
- Action-taking for sustainability
- Connectedness

(MoE, 2017)

Action competency can be individual or collective, direct or indirect. Direct actions have a direct influence on the state of the environment; indirect actions attempt to influence those who have the power to take direct action, such as politicians (Jensen & Schnack, 1997). EfS in schools and places of teacher education is encouraged to focus on local, authentic actions. This type of action helps to reduce the sense of powerlessness that often results when people are aware of environmental issues, but cannot directly act upon them due to their magnitude, complexity or distance from the individual (Shallcross, et al., 2006). Acting upon local environmental issues also strengthens the personal attachment to these actions, and increases the chances of continued involvement. This in turn may also increase intergenerational communication about the importance of taking action on issues pertaining to a sustainable environment (Shallcross et al., 2006).

2.3.6 EfS involves the development of critical thinking skills

Critical thinking skills are considered to be essential in decision making for a sustainable future (Tilbury, 1995). Socially critical thinking skills were also an element of *Agenda 21* (UNESCO, 1992 as cited in Tilbury, 1995), where it was argued that it would prepare students to be agents of environmental sustainability (Tilbury, 1995). These skills allow students to ask: Who makes decisions regarding the environment and why? What are the long-term consequences? (Tilbury, 1995). This type of thinking also aims to give students political literacy, which in turn helps them to understand and be a part of governmental decision-making (Tilbury, 1995).

However, there have been challenges to this theoretical perspective on critical thinking. Walker (1997) argues that it is not a practical perspective as it does not take into account the theories of the teachers presenting EfS, and involves too radical a change for the school system. Instead, Walker (1997) proposed the implementation of a *problem-based methodology*. This approach would address both the theory and practice of education, and aim to provide the framework for researchers to work together in the solution of a given educational problem. In his

mind then, a critical perspective is then considered to be a subset of problem-based methodology (Walker, 1997).

2.4 EfS in New Zealand

Although EfS is currently not compulsory in NZ schools, the Ministry of Education has produced guidelines for schools that choose to integrate EfS into their curriculum (Ministry of Education, 1999). The guidelines have provided the following definition of EE for teachers:

Environmental education is a multi-disciplinary approach to learning that develops the knowledge, awareness, attitudes, values, and skills that will enable individuals to contribute towards maintaining and improving the quality of the environment.

(MoE, 1999, p. 9)

These guidelines describe five aims of EfS:

- Awareness and sensitivity to the environment and related issues
- Knowledge and understanding of the environment and the impact of people on it
- Attitudes and values that reflect feelings of concern for the environment
- Skills involved in identifying, investigating and problem solving associated with environmental issues
- A sense of responsibility through participation and action

(MoE, 1999, p. 9)

The guidelines also outline four key concepts in EfS: interdependence, sustainability, biodiversity and personal and social responsibility for action. Education ‘in, about and for’ the environment is also recognised (MoE, 1999).

The Ministry of Education has also provided EfS teaching and learning guidelines for the senior secondary school sector. The guidelines outline four key concepts of

EfS: sustainability; equity; interdependence; and responsibility for action (MoE, 2017). They also describe four aspects of sustainability that are considered important, i.e. the environmental, social, cultural aspect and economic aspects. The senior secondary guidelines describe EfS as a collaborative enterprise that is most effective when it is taught across several disciplines in an holistic manner (MoE, 2017). A whole-school approach is also recommended that brings together the school community, the learning programmes, sustainable practices and policies and the care of the school grounds. While *The New Zealand Curriculum* (MoE, 2007) does not state specific achievement objectives for EfS, the secondary guidelines provide learning objectives to indicate progression in learning that are structured in three inter-related strands, i.e. knowledge and understanding; attitudes and values and actions. The cyclical process of ‘teaching as inquiry’ is recommended as the framework to help teachers plan and respond to their teaching in EfS (MoE, 2017). While these guidelines have been created for senior secondary students, the general concepts are similar and equally applicable to primary school recommendations.

While schools have the choice to integrate EfS if they wish, there is little in the way of in-service training to support this. There is also very little pre-service training in EfS (Bolstad, Joyce & Hipkins, 2015). The Enviroschools programme is one way in which teachers can achieve development in EfS within their school.

2.4.1 The Enviroschools programme

The Enviroschools programme is supported by a national team, with nearly 100 national and regional partners, including the majority of New Zealand’s councils. Facilitators from these partner organisations work with a range of resources to assist the sustainability journey. The Enviroschools programme assists children and young people in planning, designing and implementing sustainability actions that are important to them and their communities. The aim of ‘Enviroschools’ is to foster a generation of people who instinctively think and act sustainably (Enviroschools, 2016).

The Enviroschools programme recognises that EfS can be a lifelong journey from early childhood, to primary, intermediate, secondary and beyond. The programme supports long-term participation; lasting changes can take many years to become embedded but every step is a change in itself (Enviroschools, 2016).

Every ‘enviroschool’ (i.e. a school that undertakes to integrate EfS into its systems with the guidance of an EfS Facilitator) follows a unique journey that:

- Develops from small beginnings and gathers strength and breadth along the way
- Empowers people of all ages
- Builds sustainable communities
- Integrates into the curriculum; both *Te Whāriki* (the early childhood curriculum) and the *New Zealand Curriculum*
- Is grounded in Māori perspectives
- Embraces cultural diversity
- Engages in the physical, social, cultural and political aspects of the environment
- Builds towards being a whole-school/ centre approach.

(Enviroschools, 2016)

The ‘Action Learning Cycle’ is the main Enviroschools Programme tool used to help plan and carry out student-led projects. It is also a tool that can also be used to guide meetings and discussions. It enables individuals to be empowered to investigate, explore ideas, make decisions, take action and reflect on the changes they have created. The Action Learning Cycle begins by 'Identifying the Current Situation': it immerses students in the subject and allows them to explore different options. This gives a rich background from which they can then 'Explore Alternatives', then plan, design and 'Take Action'. The 'Reflection' that follows raises new ideas and consolidates learning (Enviroschools, 2016).

The Enviroschools programme supports a ‘whole centre/school approach’ to EfS, and describes four key areas of schooling life that have an effect on sustainability and student learning:

1. **People (and Participation):** Decisions and actions are made with the involvement of students, staff and other members of the community. This enables children and young people to explore real life challenges and apply their abundance of energy and ideas. Aspects of this include: fostering a sense of belonging and ownership; creating a peaceful and harmonious school community; having a ‘whole school’ vision for sustainability; environmentally-friendly practices ‘go home’ with students and change parents’ behaviour; promoting reflection on personal values and behaviours; and drawing on the combined wisdom of the multi-cultural community.
2. **Programmes:** An opportunity to make environmental education a central part of school life: students learn as they create a sustainable school and community. Sustainability is a core part of the formal curriculum, it underpins integrated programmes. Student-centred learning approaches are used and students are given opportunities to initiate their own learning. The ‘teacher’ role becomes one of facilitated learning and inquiry. An inquiry learning model is followed which leads to action.
3. **Practices:** Policies and systems support environmentally-friendly and sustainable practices, which are monitored and evaluated, to document progress being made towards sustainability. For example: reducing, reusing and recycling waste; reducing water usage e.g. harvesting rain water; conserving the use of electricity and gas; encouraging sustainable transport; and choosing environmentally friendly products.
4. **Place:** The buildings and grounds are designed to work with natural systems, and reflect the culture and heritage of the place. The school becomes a site for hands-on student action and learning, which integrates the academic, creative and practical aspects of learning, e.g. food

production, eco-building principles, environmentally friendly and healthy classrooms, designing places for composting and recycling, biodiversity and ecosystems are supported.

(Enviroschools, 2016)

The concept of a 'whole school approach' to EfS is further described in the following section.

2.5 A 'Whole School Approach' to EfS

Sustainability issues are embedded in all aspects of our lives – natural, technological, cultural and social - and thus education for sustainability in a school requires the participation of the whole school and its community in order to maximize the sustainability outcomes (Davis & Cooke, 2007; McKeown & Hopkins, 2007). A school can have a powerful role in shaping the attitudes, values and actions of its students towards a sustainable future, as schooling is both compulsory and accessible to large numbers of children for a considerable part of their growth and development (Davis & Cooke, 2007).

The principle behind a whole school approach to EfS is the notion that children have the capacity to learn both through an enacted curriculum, and informally through the messages and meanings inherent in their cultural surroundings (Hamilton City Council, 2001; Higgs & McMillan, 2006). The informal or 'hidden' curriculum within a school can significantly influence students' attitudes and behaviours. Teachers can be perceived as role models for students and messages conveyed in the classroom can either be reinforced or undermined by the actions of other staff members in the school and the general functioning and appearance of the school. Schools can also provide valuable links between students, their parents and the community (Lynagh, Schofield, & Sanson-Fisher, 1997). Schools have the potential to guide this informal learning by presenting students with a composite of individual role modelling, and school operational and governance practices that can support a given culture, for example,

sustainable living practices (Davis & Cooke, 2007; Henderson & Tilbury, 2004; Higgs & McMillan, 2006; McKeown & Hopkins, 2007).

Whole school approaches have the potential to promote sustainable lifestyles because they encapsulate positive reasons for the promotion of collaboration and participation by prioritising cultural socialisation and transformation as the main purposes of education over vocational education and socio-economic replication. The continuity of social relationships in whole school approaches is vital to maintain sustainable actions and increase the mutual trust that leads to co-operation. This is a largely bottom-up approach that reflects participatory values, but implementation is usually accelerated when the approach receives top-down support (Shallcross et al., 2006).

2.5.1 Teaching and learning approaches to EfS within a whole school approach

There is a tendency in schools to focus on EfS as 'intervention' topics occurring within the contained system of everyday schooling. For many years educational programmes, such as health and sustainability, have been presented in 'package' format whereby teachers would present information to students in the hope that it would provide them with the knowledge and skills to go forth and act accordingly (Eames, Wilson-Hill & Barker, 2013; Lynagh et al., 1997; Wyn et al., 2000). This approach inevitably obscures the significance of the broader life patterns of young people, as it presents concepts to the students in small packages, which may not necessarily be reinforced by any other aspect of the student's daily life at school (Wyn et al., 2000). There has also been little evidence that 'package' presentation has had any long-term impact on students' lives (Lynagh et al., 1997).

Due to the multifaceted nature of EfS, learning needs to take place in a variety of contexts and should not be restricted to specific school subjects, such as science (Davis & Cooke, 2007; PCE, 2004; Woollorton, 2004). Transdisciplinary approaches to teaching and learning in EfS present new ways of thinking and learning about sustainability. This approach to curriculum integration dissolves the boundaries between the conventional disciplines and organises teaching and

learning around the construction of meaning in the context of real-world problems (McClam & Flores-Scott, 2012). Transdisciplinary teaching and learning is a way of achieving new, innovative goals and enriched understanding which develops in actual practice and generates knowledge that contributes to the solutions of societal problems (McClam & Flores-Scott, 2012) i.e. the essence of EfS and action competence – there is an element of personal action that arises from the students’ confrontation with the issue (Jensen & Schnack, 1997). It is a useful contribution to the exploration and understanding of socio-scientific issues such as may occur in EfS (Paige & Hardy, 2014). Rather than considering the isolated aspects of an issue, the bigger picture is taken into account: causal relationships and the interrelationships of various elements are essential in finding solutions.

In addition to transdisciplinary approaches to teaching and learning in EfS, Tilbury (1995) describes a ‘holistic approach’ to EfS as being of key importance. In a holistic approach, EfS does not replace any subject, rather, it treats environmental and developmental issues through all aspects of the ‘whole person’ of understanding and experience, the aesthetic and creative, human and social, linguistic and literary, mathematical, moral, physical, scientific, spiritual and technological (Tilbury, 1995, p. 200). The contribution that a holistic approach makes to the study of different local, regional, national and global environmental problems results from the integration of problems and solutions in their wholeness, combining knowledge, perspectives and skills in new ways, and putting them to new uses (Tilbury, 1995).

Both transdisciplinary and holistic approaches seek to create integrated views of learning that allow people to see a broader picture of connectedness when investigating issues. i.e. they ask the ‘whole person’ to reflect and consider the issue at hand. They both reject the concepts of knowledge being taught and applied within specific boundaries of understanding and instead aim to formulate knowledge that blurs boundaries whilst addressing current issues. It is this concept ‘wholeness’ of learning which has led to the notion of a ‘whole school approach to learning.

A whole-learning response, or ‘whole school approach’ to EfS aims to provide a framework within which educators can provide curricula to develop skills and educate young people (Wyn et al., 2000). This approach builds on the important notion of *connectedness* in a school community and is more likely to have lasting effects upon student thinking if the approach is *consistent* across all aspects of school life (Harrison, 2007). Sterling (2010) suggests that a sufficient and whole-learning response to sustainability is required at three levels: personal, organizational and social; and within the following three interrelated areas of human knowing and experience: perception, conception and practice. In each of these interrelated areas, higher-order learning towards an ecological consciousness and competence involves movements towards an expanded and ethical sense of concern and engagement, a closer knowledge match with the real world, and the ability to take integrative and intelligent action in context (Sterling, 2010).

The teaching and learning approaches that support a whole school approach to EfS characteristically include inquiry-based learning, discovery learning, role-play, simulation, values clarification and analysis, and experiential learning (Eames, Wilson-Hill & Barker, 2013). Such approaches should be infused with capabilities such as sharing, listening, co-operation, negotiation, co-learning, collaboration, reflection, and a future orientation (Tilbury, Coleman & Garlick (2005), as cited in Eames, Wilson-Hill & Barker, 2013).

The whole school approach aims to critically review sustainability practices across all aspects of school life. The process of critically reviewing and changing unsustainable aspects of the schools’ operations becomes the focus for teaching and learning (Eames, Wilson-Hill & Barker 2013). A school that is operating within a whole school approach needs to have transparent processes that are forward looking, optimistic and committed to inclusiveness (Harrison, 2007). Actions and changes relating to sustainability within the school and wider community are a result of investigations, reviews and participatory decision-making. This drives the school towards becoming a continuously evolving model of sustainability (Eames, Wilson-Hill & Barker 2013). Strategies that focus on whole school approaches that include pupil’s parents and carers are more likely to be empowering and successful for those involved (Arnold, 2007).

2.5.2 Characteristics of a Whole School Approach to EfS

A number of key features of a school modelling sustainability have been identified by Henderson & Tilbury (2004). These can be summarised as:

- whole-school participation in planning and actions;
- reciprocal partnerships between the school, students, families, community and stakeholders;
- inclusive and democratic learning and teaching approaches that value critical thinking and active participation;
- transdisciplinary approaches to curriculum;
- school grounds valued as learning environments;
- the school viewed as a 'learning organisation' that supports collegial practitioner research and professional development for teachers, managers and their professional and community partners;
- leadership that places high value on sustainability

Therefore, in order for a school to achieve a whole school sustainable environment (and thus achieve the goals of EfS) it is considered necessary for the school to achieve change at three levels: pedagogical, social/organisational and technical/economic (Hamilton City Council, 2001; Higgs and McMillan, 2006; Posch, 1999).

Whole school approaches aim to integrate the following five strands of educational practice: formal curriculum and pedagogy; school culture and ethos (social and organisational aspects); school technical and economic practices; self-evaluation, and community links (Shallcross et al., 2006) A whole school approach to EfS intends to produce a school culture that practises what it teaches by reducing the disparities between taught values and values in action. A whole school approach to EfS involves transforming the system rather than reforming it or simply accommodating change, because it involves the change of the embedded cultural structure of the school (Shallcross et al., 2006).

Research on successful whole school innovation has claimed that specific conditions are likely to lead to effective sustainable change. These include strong leadership within the revised organisational structures of the school; strong implementation plans incorporating the development of a management structure appropriate to the proposed innovation; a culture of teaching staff collegiality, commitment and ownership of the innovation; transparent devolution of management into power-sharing through committee system decision making and consultation about sustaining effective change; and effective sustained teaching staff professional development to support their engagement with, and commitment to changed practices (Prain & Hand, 2003). The provision of a safe and supportive environment is also important in the adoption of a whole school approach to change (Wyn et al., 2000).

2.5.3 Orientation of the Enviroschools whole school approach towards EfS

In order to review how oriented towards sustainability the ‘Enviroschools’ whole school approach is, Sterling (2014) provides a useful framework:

- Context: does its stated purpose and boundaries of concern embrace the wider context of sustainability and futures-focus?
- Congruence: is it sufficiently grounded in real world issues and concerns, reflecting the systemic nature of the real world and the current threats and opportunities it presents?
- Culture: is it sufficiently in tune with the culture in which it is located and to the values of the learners?
- Criticality: does it encourage the examination of the dominant assumptions and values in relation to building a more sustainable future?
- Commitment: Does it engage with the ethical dimensions of issues to facilitate building an ethos of critical commitment and care?
- Contribution: through this policy and programme, will the learners, outputs and learning outcomes of the policy or programme make a difference (either positive or negative) to sustainability?

An Enviroschools whole school approach to EfS would appear to embrace the notion of ‘context’ when it considers the future users of the school and of the local ecosystem as a part of its underlying philosophy. The wider context is addressed when the whole school community is involved. Enviroschools’ whole school approaches indicate a grounding in real world issues, and reflect the systemic nature of the real world as the programme aims to present the school and its sustainability issues as the ‘here and now’ for the students. The Enviroschools programme recommends addressing local culture and the values of its learners through its recognition of the key area ‘People and participation’.

By allowing the students and wider school community to be actively involved in directing the path of the whole school approach, it emphasises giving their values a chance to shape the nature of the EfS journey. The Enviroschools programme seeks to address the dominant assumptions and values in relation to building a more sustainable future by encouraging students to make observations regarding the state of the environment and decisions regarding what action to take, i.e. is what we are doing now sustainable and how will it affect the future of humanity and the natural world? The ethical dimensions of issues that facilitate building an ethos of care and commitment and care are indicated within the ‘People and participation’ aspect of Enviroschools’ whole school approach, and the sustainable attitudes and values that are developed therein. Enviroschools would aim to make a difference to the sustainability of system policies, programmes and outputs through their ‘Programmes and practices’, and the ‘People and participation’ aspects of a whole school approach.

Tilbury’s (1995) six key concepts within EfS, i.e. relevance, holism, values, issues, actions, and critical education (Section 2.3), can be used to determine how many key aspects of EfS the Enviroschools programme addresses. The Enviroschools approach, in theory, addresses concepts such as relevance, action, attitudes and values, and critical thinking (Tilbury, 1995). However, while the Enviroschools whole school approach may address many aspects of EfS and demonstrate whole school orientation towards sustainability, the specific expertise of the EfS facilitator, and the knowledge, values and attitudes of the school staff

appear to have an effect on the integration of sustainability into school-wide practices (Bolstad et al., 2015).

Further to this, Eames et al., (2013) developed a framework for whole-school approaches in New Zealand schools, as the result of asking how a school might identify elements of their current practice that align with a shift in thinking towards EfS (See Appendix 16 for details of the four areas and 25 aspects that were included in the final framework). The framework was guided by two overarching ideas: firstly, the process of learning how to learn, and that it occurs in authentic contexts; and secondly, by the four key areas of school life, as recognised by Enviroschools, within which sustainability can be embedded, i.e People (and participation), Programmes, Practices and Place (Eames et al., 2013). The framework was intended to be used as a professional learning tool to support better understanding and implementation of whole-school approaches to EfS in the following three ways:

- Clarifying what is meant by the term ‘whole-school approaches to EfS’
- Helping a school to identify what might be involved if it initiated a whole-school approach to EfS
- Providing a means by which a school that considers it currently has a whole-school approach to EfS can discuss its approach and possibly develop it further

Research has shown that each school must find its own whole-school approach to EfS that fits its own, unique context (Eames et al., 2013). The framework described by Eames et al. (2013) provides guidance for how orientation towards sustainability in a school can be achieved through a whole school approach. Further aspects of implementing a successful whole school approach are outlined below.

2.5.4 Implementing a successful whole school approach to EfS

Teachers have identified that the greatest challenge they met in dealing with whole school approach projects was addressing the *whole school* aspect (Bolstad,

Joyce & Hipkins, 2015; Wyn et al., 2000). The implementation of a single classroom programme only needs the involvement of that particular teacher. Addressing school culture and environment, policy and practices and developing or extending partnerships with parents, and community groups requires direction of time and energy to work with others. This big picture approach entails large-scale change, which takes time and commitment to drive and is often seen as activity above and beyond the prime duty of teaching class or contributing to student or faculty management (Wyn et al., 2000). Rickinson, Hall and Reid (2015) identified five key aspects of a whole school approach programme that may be influential in implementing EfS across school systems:

- Structured frameworks – what to do?
- Supportive facilitation – how to do it?
- Internal monitoring – how are we doing?
- External verification – why is this important?
- Local networks – who else can help?

Specifically, Rickinson et al., (2015) note that structured frameworks appear to have less influence in schools where their level of detail is perceived to be overwhelming, prescriptive, or unachievable. In contrast, such frameworks may provide greater influence when they help schools by providing focus and bring together any existing initiatives (Rickinson, et al., 2015).

The success of a whole school school approach to EfS also depends on dedicated support in the form of information resources and funding. New Zealand's Enviroschools programme provides participating schools with an '*Enviroschools Kit*', a classroom resource to assist teachers with the practical side on implementing EfS into the school. Long term funding and support can help the school to focus on long term strategic programme plans, which in turn is beneficial for the development of the whole school approach (Tilbury & Wortman, 2005). The success of a programme may also depend on clarity around what a whole school approach programme actually involves, determining what 'school sustainability' means (Rickinson et al., 2015, p.365) and clarifying the

process of influence of different aspects of the programme on the participants (Rickinson, et al., 2015).

While many teachers are keen to engage in EfS, few have the knowledge and capacity to reorient the curriculum and engage in participatory pedagogies. Professional learning and development in EfS for educators, and access to experts in education for sustainability, e.g. EfS Facilitators, appears to help schools that are engaged in a whole school approach to EfS to fare better overall (Tilbury and Wortman, 2005). Effective EfS facilitation helps schools to understand how to develop and deepen their work relating to sustainability, and seems to have less influence when it is seen to be simply focusing on keeping schools on track with aspects like programme accreditation (Rickinson et al., 2015). This would aim to increase the sustainability literacy of the practitioners, who would then be better armed to re-direct their teaching, the organisational structures and understanding of the need for change within educational systems culture. Sustainability capabilities will only be embedded into curriculum as part of a long-lasting cultural change programme through a strong focus on well-structured Professional Development programmes (Holdsworth et al., 2008).

2.5.5 Evidence in support of a whole school approach to EfS

In support of a whole school approach to EfS, it has been noted EfS innovations in schools that are led by individuals or small groups often do not have the inherent strength that is required to establish and maintain change in a whole school (Posch, 1999). These innovations can fail because if only an individual or small group is modelling EfS, then the modelling may be inconsistent across the school community. Also, if innovations are only supported by an individual or small group, then they may falter if that individual or group ceases to commit or loses support (Posch, 1999; Woollorton, 2004). Therefore, it appears that the goals of EfS are more likely to be met if students are immersed in a consistent school culture of sustainability (Higgs and McMillan, 2006). This is of particular importance in New Zealand where the school curriculum encourages EfS but does not mandate it, leaving the implementation at the discretion of each school.

Tilbury and Wortman (2005) found that schools that restructured their decision-making processes to be more inclusive and participatory with the whole school community, were more likely to demonstrate leadership and models of good practice. Rickinson et al.,(2015) note that whole school programmes may improve, deepen and develop sustainable practices within schools. Results emerging from whole school initiatives with respect to EfS indicate increased student participation in decision- making, an increase in practical skills, increased awareness of local and indigenous knowledge, improved group working skills, a gain in students' life skills and positive changed in attitude, knowledge and level of involvement (Tilbury & Wortman, 2005). Additional outcomes include specific environmental actions such as reducing consumption, increasing the efficiency of resource usage, and increasing biodiversity within schools and communities (Eames, Wilson-Hill & Barker, 2013). Teachers and administrators appear to be benefiting from whole school programmes, changing and refining pedagogies to reorient teaching towards more learner-centred approaches. Schools that are participating in whole school approaches to EfS experience greater levels of involvement in school life by parents and the community as a whole (Tilbury and Wortman, 2005).

2.6 Chapter summary

Education for Sustainability, or 'EfS', has evolved from a concept of care and concern for the natural environment, i.e. 'environmental education', towards a broader, more holistic view which includes sustainability of not only the biological and bio-physical environment but also social, economic, political, biological and physical aspects.

While sustainability has no single and agreed meaning, it can generally be thought of as: 'an unending quest to improve the quality of people's lives and surroundings, and to prosper without destroying the life-supporting systems that current and future generations of humans (and all other species on earth) depend on' (PCE, 2004). EfS is generally regarded as learning how to make decisions and take action that considers the long-term future of the environment, economy

and social justice of communities (Wooltorton, 2004). There is a commitment to increase knowledge, and engage people in and change their actions, values, attitudes towards that of sustainable environmental and social management (Shallcross et al, 2006; Tilbury, 1995).

Education for sustainability will require people and organisations to see that changes towards sustainability can be made, and that many systems and practices will need to be transformed in order for future generations to achieve a good quality of life (PCE, 2004). EfS can be outlined according to the following six key concepts (Tilbury 1995): (1) EfS is relevant to the present and future needs of society; (2) EfS is holistic - it recognises the importance of social, economic, physical and biological aspects of the environment; (3) EfS is values oriented - it teaches social responsibility, concern for all life forms, harmony with nature, and commitment to work for and with others; (4) EfS is issues-based - it involves people in the identification and investigation of environmental issues, leading towards possible solutions or actions towards resolution of the issue; (5) EfS is action-oriented – it requires constructive action from people (in real or simulated situations); and (6) EfS involves the development of critical thinking skills that are required for effective decision-making.

Although EfS is not compulsory in New Zealand schools, the Ministry of Education has produced guidelines for those schools that choose to integrate EfS into their curriculum (MoE, 1999; Ministry of Education, 2017). The guidelines provide support material for the successful integration of EfS, and outline the learning objectives, pedagogical approaches and key aspects and concepts of EfS (MoE, 2017).

An Enviroschools programme exists in New Zealand. Facilitators from partner organisations work with a range of resources to assist the sustainability journey. The Enviroschools programme supports a ‘whole centre/school approach’ to EfS, and describes four key areas of schooling life that have an effect on sustainability and student learning: (1) People and participation; (2) Programmes; (3) Practices; and (4) Place.

A school can have a significant role in shaping the attitudes, values and actions of its students towards a sustainable future, as it is accessible to large numbers of young people (Davis & Cooke, 2007). A whole school approach to EfS is based upon the idea that people have the capacity to learn informally through the messages and meanings embedded in their surroundings (Hamilton City Council, 2001; Higgs & McMillan, 2006). Whole school approaches aim to integrate formal curriculum and pedagogy; school culture and ethos (social and organisational aspects); school technical and economic practices; self-evaluation, and community links. A whole school approach to EfS works to transform the system rather than reforming it or simply accommodating change (Shallcross et al., 2006).

The greatest challenge teachers have described in integrating whole school approach projects was succeeding with the *whole school* aspect. Professional development in EfS for educators is one key aspect of embedding EfS into schooling systems. This aims to increase the sustainability literacy of the practitioners who would then be better able to re-direct their teaching, the organisational structures and the development of understanding the need for change (Wyn et al., 2000).

EfS innovations in schools led by individuals or small groups often do not have the inherent strength that is required to establish and maintain change in a whole school (Posch, 1999). It appears that the goals of EfS are more likely to be met if students are immersed in a consistent school culture of sustainability, i.e. a whole-school approach (Higgs & McMillan, 2006).

The following chapter reviews the literature surrounding theories of change: transformational learning, student empowerment, teacher professional development, educational system change. These theories are discussed in general and with respect to embedding sustainability in the school system.

Chapter 3

Literature review –

Transformative learning and agents for change

3.1 Chapter Outline

The following chapter reviews the literature surrounding theories of change, in general terms and with respect to embedding sustainable practices and EfS in schools. Transformative learning, instrumental and emancipatory learning, and action competence are reviewed. The process of change, and approaches and challenges to implementing a whole school system are discussed. Agents for environmental change, such as students, teachers and school leaders are also examined in the context of a whole school approach to EfS.

3.2 Transformative Learning

An outcome of many current schooling systems is one of social reproduction and there is a strong focus on literacy, numeracy and assessment, with little time given to subjects outside these areas (Birdsall, 2010). Knowledge has been reduced into fragmented, abstract disciplines (Holdsworth et al, 2008; Sterling 1996) which has often led to conflict between individuals and ideologies (Sipos, Battisti & Grimm, 2008). This approach to education has led to the search for value-free knowledge, a goal of efficiency and a focus on technology (Sipos et al., 2008). As a result, it has led to de-humanisation of the human condition, devoid of attachment and meaning. However, no knowledge is truly value-free, and the modernist approach to education has in fact perpetuated the values that have furthered the conquest of nature and the industrialisation of the planet (Sipos et al.,2008; Sterling, 1996). It has been argued that society needs to find alternative approaches to education that reflect and contribute to sustainable values (Sterling, 2006) as traditional educational systems are not considered to be effective in supporting a sustainable existence. Instead, it has been argued that we need to further the development of

students' critical thinking and action competence, key aspects of a transformative educational approach such as EfS (Birdsall, 2010).

Transformative learning is an overarching concept which aims to develop autonomous thinking (Cranton, 1994; Merriam & Ntseane, 2008; Merriam, 2004; Nazzari, McAdams & Roy, 2005) and to empower students to challenge old models and assumptions with tools of critical reflection and analysis (Merriam, 2004; Merriam & Ntseane, 2008; Share, 2007; Sipos, Battisti & Grimm, 2008). Critical reflection is fundamental to transformative learning, which invokes processes of re/constructing knowledge based on life experiences and arriving at new ways of thinking and being (Merriam & Ntseane, 2008; Merriam, 2004; Sipos, Battisti & Grimm, 2008). Critical reflection occurs when individuals look back on prior learning and focus on assumptions about the content of the problem, the process or procedures followed in problem solving, or the pre-suppositions on the basis of which the problem has been posed (Mezirow, 1990). Perspective transformation can occur through an accumulation of transformed "meaning schemes" (rules, roles and expectations that govern the way we see, feel, think and act) that have themselves been transformed by reflection upon anomalies (Mezirow, p.1 1990). Cranton (2006) suggests that the central process of transformative learning may be either rational, affective, extra-rational or experiential depending on the person doing the learning and the context in which the learning takes place. For example, one person may consciously engage in a self-reflective process, while another may view the transformative process as an imaginative one (Cranton, 2006).

Nazzari, McAdams and Roy (2005) present the following practices and conditions essential for fostering transformative learning:

- A safe and trustworthy learning environment
- Establishment of a democratic and open environment that promotes critical reflection
- Experiential learning opportunities
- Learner-centred approaches to promote student autonomy

- Feedback and self-assessment by ‘facilitators’ to participants, participants to participants, and by participants to ‘facilitators’
- Appropriate ‘facilitator’ characteristics, e.g. trustworthy, empathetic, authentic, caring and sincere
- Embracing the cultural background of the participants in the group.

As a part of the transformative education process, it may also be necessary for the transformative educator themselves to be willing to undergo some form of self-transformation in order to provide a transformative learning environment (Johnson-Bailey & Alfred, 2006). This adds authenticity to the transformative education process (Cranton, 2006) and suggests the necessity of the education system engaging in change in order to facilitate change (Sterling, 2001).

3.3 Transformative Learning and EfS

In schools today, the learning outcomes and content can be determined in advance, while the teacher delivers the knowledge and skills to the students in a transmissive manner. Little critical thinking is required in this form of education (Birdsall, 2010) and it does not lead to questioning of current practices. Contemporary schooling has been described as perpetuating environmental (sustainability) problems through social reproduction, where each generation of students learns the same societal, environmental and political values that helped create the current problems (Birdsall, 2010; Bolstad, 2003; Davis & Cooke, 2007; Fien, 1995; Gruenewald, 2003; Huckle & Sterling, 1996; Sipos, Battisti & Grimm, 2008). In order to help people develop attitudes and values that promote a sustainable existence, it has been suggested that the purpose of education needs to be to *transform* society towards a more sustainable future by encouraging and presenting alternative courses of action that contribute to sustainability (Arlemalm-Hagser & Davis, 2014; Bolstad, 2003; Davis & Cooke, 2007; Dymont & Hill, 2015; Huckle & Sterling, 1996; Sterling, 2001). EfS pedagogy may exist in direct contrast to current educational practices: students are encouraged to critically examine their current patterns of behaviour and the effects on the environment, suggest alternatives and make changes. This type of pedagogy is viewed as transformative, and the learning is holistic, open-ended and the students

are encouraged to be autonomous. Skills such as co-operation and negotiation are important within EfS (Birdsall, 2010).

Sipos et al., (2008) couple sustainability education with transformative learning, which can be understood as a process of effecting change in a sustainability frame of reference, with an underlying assumption that individual and social change may result through transformative group learning. Such education is founded on critical pedagogy, which critiques the idea that knowledge is value-free and works to transform society to be more democratic and less oppressive (Share, 2007). Transformative education also uses a constructivist pedagogy in which students actively construct and reconstruct knowledge, transforming meanings to arrive at new understandings and different ways of thinking (Share, 2007).

Sipos et al., (2008) describe a transformative sustainability learning (TSL) framework which is a series of learning objectives that correspond to cognitive (“head”), psychomotor (“hands”) and affective (“heart”) areas of learning. This allows facilitation of personal experiences for participants that can result in changes in knowledge, skills and attitudes related to improving the environment, society and the economy. Sipos et al., (2008) believe that TSL represents a distinct and useful pedagogy that is a result of joining the pedagogies that inform both sustainability and transformative education. Comparisons may be made between the TSL approach to EfS (Sipos et al., 2008) and the ‘in, about and for’ formula for EfS (Barker & Rogers, 2004), (as outlined in section 2.3.2 of this thesis). ‘Cognitive’ learning in EfS, as described by the TSL approach, may equate to learning ‘about’ the environment, whereby students gain knowledge about environmental concerns. Learning ‘in’ the environment may address the ‘psychomotor’, or ‘hands on’ dimension of the TSL approach where students are engaged in practical experiences in the environment. However, having a learning experience ‘in’ an environment may or may not actually be contributing to an individual’s ability, or indeed their inclination, to contribute to the solution of a sustainability issue. Education ‘for’ the environment, or environmental action as described by Tilbury (1995), may be said to require the ‘heart’, or ‘affective’ aspect of learning: in order for an individual to initiate environmental action or begin to transform their lifestyle towards that of sustainability, they need to show

intrinsic attitudes and values (i.e. show care and concern) relating to care of the environment (Tilbury, 1995).

Sterling (2001) describes three orders of change and learning which can have an effect on the level of transformative learning in a school system. First-order learning does not require a change in values in beliefs or values. Second-order learning involves critically reflective learning that examines the assumptions that influence first-order learning. Third-order learning is a creative process that involves a deep awareness of alternative worldviews and ways of doing things. Transformative learning takes place when second, and where possible, third-order learning, occurs (Sterling, 2001). A whole school approach to EfS aims to provide second, and third-order transformative learning opportunities (Sterling, 2001) that empower individuals, encourage the development of critical thinking skills and realise the implications for a more sustainable way of living (Holdsworth et al., 2008; Huckle & Sterling, 1996; Sterling, 2001; Tilbury & Henderson, 2004).

It appears that cultural and educational systems that wish to practise successful EfS need to engage in a double-learning process - they need to undergo deep, third-order change *in order to facilitate* deep, third order change. In other words, they need to transform in order to be transformative (Sterling, 2001). To accommodate this paradigm shift, it has been suggested that the structural foundations and goals of modern schooling need to be examined and rebuilt (Sipos et al., 2008; Sterling, 2001).

It has been proposed that EfS may help to empower people to seek out and examine their own frameworks for thinking (Holdsworth et al., 2008) and thus may provide the transformation that is required to steer humanity away from unsustainable practices (Sipos et al., 2008). In identifying all EfS programmes to have a common vision of perspective transformation, we may better encourage and enable all participants of education to challenge and be open to change in their own minds, beliefs and behaviours (Sipos et al., 2008). Different teaching and learning approaches in EfS education may affect individuals abilities to transform their frameworks of thinking with respect to sustainability.

3.3.1 Teaching and learnings approaches in EfS: Instrumental and emancipatory learning

Two approaches to learning in EfS have been described by Wals, Geerling-Eijff, Hubeek, van der Kroon & Vader (2008): instrumental and emancipatory. The instrumental approach starts by formulating specific goals with respect to a specific behaviour, and then targets a specific group to address with these goals. The instrumental approach improves awareness about, and knowledge of, sustainability concerns. Instrumental approaches include educational and communication strategies to influence peoples sustainability related behaviour, awareness campaigns and activities that have clearly described objectives of a behavioural nature (Wals et al., 2008). Instrumental approaches could be said to involve first-order learning (Sterling, 2001) as individual values and beliefs relating to EfS are not necessarily being influenced by the strategies engaged by others.

In contrast, the emancipatory approach attempts to engage participants in active communication in order to establish mutual objectives, shared meanings and a joint plan of action which aims to improve sustainable practices. This approach aims for long term changes relating to public support, engagement and involvement (Wals et al., 2008). An emancipatory approach to EfS involves second and third order learning (Sterling, 2001) as individuals are examining their practices and attempting to resolve sustainability issues of their own accord, as opposed to being 'coerced'. Critical pedagogy is an emancipatory educational approach which promotes 'conscientisation', i.e. becoming aware that the individual has a voice, that they matter, that the individual can and does influence others, and can transform their own reality (Thousand, Diaz-Greenberg, Nevin, Cardelle-Elawar, Beckett & Reese, 1999). Critical pedagogy values the socio-political and cultural context of the learners and acknowledges that a learner's culture and life experiences shapes their identity (Thousand et al., 1999). Paulo Freire, considered to be the premier international philosopher of critical pedagogy, viewed education as supportive of people in developing their ability to transform the circumstances in which they live (Dumbleton, 1990; Freire, 1972; Thousand et al., 1999). Freire saw 'traditional' education as often being used by powerful

social groups to persuade other groups that they have no real choices and that their situation is beyond their control, leading to a culture of powerlessness. Freire considered that education should lead to liberation (Freire, 1972). His philosophy suggests engaging in dialogues with ‘students’ in order to discover important themes in their lives within which to frame their education. Teachers that apply Freire’s philosophy focus on the principles of dialogue, voice, praxis (action-reflection-action cycle) and reflection, moving education from a separatist perspective to an inclusive perspective (Dumbleton, 1990).

Wals et al., (2008) have shown that the emancipatory approach to sustainability issues can be useful in situations where there is no clear solution or the situation is open to multiple interpretations, and which require learning processes that are grounded in the participants’ immediate social and physical environment. The probability of long-term commitment from participants is improved when people develop some form of social cohesion and can see immediate results of their efforts. By continuously creating ‘positive feedback loops’ participants in a sustainability ‘project’ can see that change is occurring even if it seems that nothing is happening, i.e. ‘soft’ results such as improved relationships between participants may occur sooner than ‘hard’ results such as visible outcomes (Wals et al., 2008).

When engaging people in sustainability-related actions it can be helpful for educators to consider the kind(s) of challenges that are at stake, and this in turn can help to determine what kind of education, participation, communication, or mix thereof is the most useful (Wals et al., 2008). It can also be important to consider which of these approaches will best lead to an ‘action competence’ approach to EfS, a key aspect of EfS (Jensen & Schnack, 1997; Tilbury, 1995)

3.3.2 Action competence

Section 2.3.5 introduces sustainable actions and the concept of action competence. This section follows on from 2.3.5, refreshing and discussing specifically the notion of action competence and its application in schools. Many EfS programmes

in schools include an ‘action-oriented’ dimension. An action is specifically targeted towards the solution of a problem that is being focussed on. This is in contrast to an ‘activity’, which may help motivation and acquisition of knowledge but does not address a solution to a problem (Jensen & Schnack, 1997). Actions differ from behavioural change, which comes about as a result of influences by people or advertising/media campaigns, i.e. instrumental learning approaches (Wals et al., 2008)

‘Action competence’ is an educational ideal, rather than a specific goal to be reached (Mogensen & Schnack, 2010). Action competence differs from taking action that only addresses the end results of the problem, e.g. picking up litter from a waterway removes the waste but does not address the problem of why there is so much waste in the first place and how it got there (Birdsall, 2010). Actions may contribute directly to the solution of an environmental problem, or indirectly, by influencing others to do something to contribute to the solution of the problem; one or more indirect actions may lead to a direct action (Jensen & Schnack, 1997).

Action competence is an educational approach that works with democratic and participatory ideas in relation to teaching-learning (Jensen & Schnack, 1997). An action competence approach views EfS as problem-oriented and cross-curricular, whilst retaining an interest in academic knowledge and fundamental concepts. Specifically, it requires knowledge and insight about what problems are, how they arose, and what possibilities exist for solving the problems; commitment and motivation to solving the problem; a vision of the future and how one would like it to look; and action experiences that connect and engage emotions, values and knowledge (See section 2.3 Key characteristics of EfS) (Jensen & Schnack, 1997). The action competence approach calls particular attention to self-evaluation and reflection, which provides an opportunity for participants to assess their own strengths and weaknesses (Mogensen & Schnack, 2010).

Among the challenges that may arise when developing an action competence approach in a school are the organisational and social constraints that may be placed upon the teachers by their existing educational system. Educational

practices, or participant attitudes that may be present in a school may conflict with the socially critical nature of developing action competence (Eames et al., 2006; Uzzell, 1999). Teachers may also struggle to find the time to plan and take action with their students, and may lack the equipment and facilities with which to support action (Eames et al. 2006). Teachers' abilities to develop action competent students may also be affected by focussing on the outcome of the action, rather than emphasising the learning in the action-taking process itself, i.e. the learning achieved through action (Birdsall, 2010) Additionally, there is the challenge of deciding what, in fact, sustainable living looks like, i.e. what goals are students striving for with an action competent approach (Wals & Jickling, 2002), and how 'much' sustainable action results in an action competent individual? Pedagogical approaches that may facilitate students' learning around sustainability and the development of action competence include teacher role modelling and experiential learning, and social constructivist activities such as collaborative learning, and argumentation (Eames, et al., 2006).

A transformative approach to EfS may offer the most effective way in which to develop students' action competence (Eames et al., 2006). To assist students in transforming their thinking from guided action to informed, independent action, a whole school approach to EfS can help people to understand that what they are doing now makes an immediate contribution to a sustainable future. A whole school approach sends a powerful message to students by bringing together the school's community, learning programmes, practices and considerations of their physical place and promotes planning and participating in positive action (MoE, 2017). In order for a transformation towards a whole school approach to be successful, a number of changes to school systems may be required. Approaches to transforming a whole school system are summarised below.

3.4 Approaches to transforming a whole school system

When transforming an entire schooling system, the whole system needs to be transformed in a sustainable way, rather than in a piecemeal way (Duffy, 2006). For effective school transformation, it must be recognised that significant change in one part of a school system requires changes in other parts of the system

(Duffy, 2006). The process of transforming a school system is a far more complex and difficult endeavour than is piecemeal change, as it requires designing and implementing an entirely new paradigm of education, rather than changing a piece within the existing paradigm (Reigeluth, 2006).

An approach to systemic transformation that has been offered is the 'Idealised Design Approach' which requires much time and energy to be invested in designing the new system before it is adopted. Issues with this approach include: (1) the large amount of time that must be put in to the new system before results are seen, which could cause loss of motivation for the change; and (2) key players in the change may move on and leave gaps in the system (Reigeluth, 2006)

Reigeluth (2006) describes an alternative, 'Leveraged Emergent Approach' to transforming a school system which is based on the following principles: (1) Leverage - in transforming a system to a new paradigm it is hard to change everything at once. One must first change part(s) of the system that will exert leverage on the remaining parts, in order to prevent them from changing back to the original paradigm. Starting with a few senior-leverage changes can make the whole systemic change quicker and easier; (2) Emergent design - it is difficult to design a new system from scratch because it is difficult to predict what will work best. In an emergent design approach a few guiding principles are selected, a few senior level leverage changes are implemented, and the remaining changes emerge over time; (3) Visible progress - it is important for participants in a systemic change process to be able to see progress often. This maintains motivation (Reigeluth, 2006).

The motivation for school-wide change when transforming a school system requires reaching a broad consensus on the school system changes, with a focus on mindset change which becomes the impetus of motivation for change. (Reigeluth, 2006). Reigeluth (2006) describes four approaches to social system change which involve varying levels of mindset change on the part of the participants:

(1) First generation, 'Design by dictate' - systems engineering methods of military and space programmes adapted for social systems. The technical 'expert' was engaged in 'social engineering' by prescribing solutions to social problems. Implemented either by legislation or by top-down decree.

(2) Second generation, 'Designing for' approach - a consultant/expert was brought in, studied a particular system, conducted a needs analysis, and presented their solution to the decision maker. If the solution was implemented, it was using coercion.

(3) Third generation, 'Designing with' approach - a consultant /expert stays and works with selected groups who represent a cross-section of the system, and discuss what 'should be'.

(4) Fourth generation, 'Designing within' approach - based on the belief that the future is open to our purposeful intervention, accomplished through design. This approach asserts that designing our future is OUR responsibility, and that we can and should take charge of shaping it. By learning how to design our future we empower ourselves individually. This approach is based on the assumption that in order to be authentic and sustainable, human activity systems must be designed by those who are in it, reflecting their values and ideas, a result of their combined creative participation.

A fourth generation approach to systems change is, in effect, describing an ideal whole school approach to EfS, and reflects many attributes of sustainability education, e.g. whole school participation, student empowerment and critical thinking (Henderson & Tilbury, 2004). It may be, however, that a third generation approach to change may be apparent during the early stages of integration of a whole school approach if an EfS Facilitator or support person is required to provide scaffolding for staff to assist them in becoming self-directed in their systems change.

Systems design in the context of educational activity is a future-creating, disciplined inquiry. The people in the education system co-develop a vision and

purpose for education, and subsequently engage in the design of a system that will correspond with that vision. Those who engage in the design of systems of learning pursue the following lines of inquiry:

- What is the nature of, and what are the characteristics of our current information/knowledge age?
 - What are the educational implications of these characteristics?
 - What should the role and societal function of education be?
 - What should be learned, by whom, when, where and how?
 - What core values and ideas should guide the development of an educational vision and subsequent educational system?
 - What approach, strategies and methods should we use in the design, implementation and development of the system?
 - What opportunities, means and resources will be required in adopting the design, developing the system and carrying out the educational functions?
- (Banathy, 1991)

The form and extent of innovation is greatly dependent on the attitudes and values of teachers. Top-down innovation often disregards the power of teachers to mediate change; successful innovation is often better achieved through a process of adaptation, combining central motivation with active engagement by teachers (Priestly & Sime, 2005).

A framework of understanding of the social aspects of the process of change may assist the development of innovations in schools, such as whole school approaches. Archer's (1988) social theory provides a useful framework for understanding the processes of change in schools. Archer makes an analytical distinction between the cultural system (i.e. the body of knowledge) and socio-cultural interaction (i.e. the ways in which such knowledge is applied by people). According to Archer, individuals are influenced by, but never determined by, the cultural system and the structures that surround their lives. When ideas and knowledge utilised to promote change are consistent with the ideas and values that already exist within the change context, socio-cultural interaction readily

assimilates the new ideas and change is relatively unproblematic. On the other hand, new ideas may be in conflict with existing ideas and values which can cause problems with the assimilation of the change, for example, ideas and values relating to EfS may conflict with those inherent in many current teaching practices (Birdsall, 2010). Archer suggests three potential socio-cultural consequences of such contradictions with the cultural system. In the first instance, the new ideas are modified to fit with the existing ideas and values and no change occurs. In the second instance, existing ideas and values are modified to fit with the new ideas, producing a form of change. And in the third instance, both old and new ideas are adapted to reduce or eliminate any problems that may have otherwise occurred when new and existing ideas and values conflict (Priestly & Sime, 2005). Priestly and Sime (2005) suggest that this third instance is necessary for successful change in school systems.

Additional influences on change in school systems include the structures within the school such as power structures, staffing, timetabling and assessment. Any issues arising from conflicts with the existing and new systems are played out through socio-cultural interaction, resulting in change or conflict according to the instances described above (Priestly & Sime, 2005).

Priestly and Sime (2005) have identified four factors that can help with a whole school innovation, such as a whole school approach to EfS: (1) Pro-active leadership; (2) Professional trust in teachers' capacity to drive change; (3) Dialogue and collaboration between participants; and (4) the nature of the innovation, i.e. 'start small'.

In order for reform to be sustainable within an organisation, in this case a primary school, a number of elements need to be simultaneously present. The school needs to be committed to three aspects of moral purpose: closing the gap of student learning; treating people with respect; and altering the social environment for the better (Fullan, 2005). There needs to be commitment to changing context at all levels, changing whole systems means changing the entire context within which people work. Lateral capacity building through networks across schools, where principals and teacher leaders collaborate with other schools to learn from

and contribute to each other's school improvement, is a powerful strategy in the development of sustainable reform. Sustainable schools can work towards solving the problem of having both local ownership and external accountability in their entire system. This can be achieved through 'intelligent accountability', a collaborative culture of accountability where communities interact around given problems and have shared accountability to peers, and the strengthening of vertical relationships, e.g. state/district, district/school (Fullan, 2005). Sustainable reform requires continuous improvement, adaptation, and collective problem solving in the face of arising challenges. This can be supported by deep learning for students, teachers, schools, districts and governments. A dual commitment to both short-term and long-term results is useful within a sustainable reform, short-term results build confidence in stake-holders, but should not override the long term goals. Sustainable change is cyclical, not linear. Learning organisations need to continuously investigate, learn, experiment and develop better solutions over time. The critical lever behind these elements of sustainable reform is leadership at all levels, leaders who put into place the aforementioned elements and act in ways that affect larger parts of the system as a whole (Fullan, 2005).

One of the many challenges faced by systems that want to make major changes in their educational practices is the difficulty of dealing with the current beliefs, values, and attitudes of those involved (Forlin, 2007). Change can arouse a mixture of responses from participants, from negative emotions such as fear and anxiety which challenge the implementation of the change; to more progressive emotions such as excitement, and a feeling of being energized (Fullan, 2001).

Forlin (2007) presents a support model that discusses ways of addressing some of the challenges for better enabling professional and community collaboration to further enhance the whole-school approach to inclusive educational practices. This support model allows the inclusive practices to be implemented and sustained. If inclusive education is going to be sustainable, i.e. if the whole school approach is going to be sustainable, then the following points, at least, need to be considered: appropriate support structures must be provided at both a systemic and school level that are suitable to the context and realistic for supporting inclusive practice; the participants must consider the new changes to be realistic;

changes must also be manageable within other school constraints, it cannot be 'added on' to what is happening at the moment, it must be a change in philosophy that is embedded across all aspects of the school's culture policy and practices; And providing props that will sustain progress and help promote movement towards greater inclusivity. Props could be areas such as a shared language of understanding, a vision and a mission, a shared school ethos, and appropriate curricula (Forlin, 2007).

To really embrace a whole schooling change, systems, schools and classrooms need to be changed (Forlin, 2007) and agents for this change are discussed next.

3.5 Agents for environmental change

Within a school system there are a number of potential agents for environmental change. The students can be empowered to be agents of change by developing knowledge relating to sustainability and participating in active learning experiences. Professional learning and development for teachers can assist them to become agents of change in the classroom. And school leaders, the principal in particular, can support and drive change. Each of these agents are discussed next.

3.5.1 Empowering children to be agents for environmental change

Empowering students to act in an environmentally-responsible manner is the central goal of EfS. Actively involving children in taking action is recognised as a key element in promoting a life-long disposition towards caring for the environment (Arlemalm-Hagser, & Davis, 2014; Hart, 1997). Giving students the opportunity to participate in sustainable actions gives them a say in deciding the future of their community, which is in alignment with the futures focus of EfS (Birdsall, 2010). For people to participate effectively in sustainable actions, they require relevant knowledge, skills and positive attitudes and values towards the environment (Birdsall, 2010).

Taking action is not a simple process, with a key issue being the extent to which the teacher and students share the power and maintain transparency in the learning

and decision-making process (Birdsall, 2010). Five stages of children's participation can be considered: children are listened to; children are supported in expressing their views; children's views are taken into account; children are involved in the decision making process; and children share power and responsibility (Shier, 2001). Hart's (1997) ladder is another way of thinking about children's participation, which shows a graduated approach starting with child manipulation, tokenism and decoration. The ladder moves up through different levels, or 'rungs', involving children as increasingly active participants for change, to the highest 'rung' where decisions are child-initiated and shared with adults. Participation has both individual and shared elements, i.e. an individual child may initiate an idea or action which is then taken up by a group of children. In terms of a transformative approach to EfS, there is a preference for shared participation as it harnesses the ideas, creativity and energy of the wider group (Arlemalm-Hagser & Davis, 2014).

In order for students to take environmental or sustainable action, it is accepted that relevant knowledge is necessary. Four possible dimensions of knowledge could be considered 'pre-conditions' leading to student action:

- Dimension One – knowledge about the nature and extent of the environmental issue. The knowledge is usually scientific in nature and provides a starting point for thinking about sustainable actions.
- Dimension Two – knowledge about the underlying social, political and economic structures and how they contribute to sustainability issues. This dimension aids in the understanding of how sustainability issues arise.
- Dimension Three - knowledge about how to effect change. This type of knowledge relates to knowing about how to control ones own life and how to bring about changes in society through direct or indirect actions.
- Dimension Four – knowledge about the direction of change. This knowledge relates to people having a futures focus and provides the motivation for sustainable behaviour.

(Jensen, 2002)

A three part model has been derived from the above four dimensions to provide a 'simplified' tool for teachers to assist students' learning about the nature of action. The first part of the model describes learning 'about' action, where students learn how to envisage the future and ways of achieving their vision. The second part of the model relates to learning 'through' action, where students experience the planning and taking of action. The third and final part is where students learn 'from' action, whereby students have opportunities to reflect on their actions and the actions of others to determine their efficacy (Birdsall, 2010).

In addition to knowledge, field experiences are considered useful vehicles for implementing aspects of education that are critical to the development of ability to take environmental action and cultural change towards sustainability (Gambino, Davis & Rowntree, 2009). Specifically, direct interactions with nature during childhood have been shown to have a significant influence on the development of positive attitudes towards the environment (Barratt-Hacking, Barratt & Scott, 2007; Chawla, 1999). Restricted opportunities for children to engage in environmental learning, for example, by limiting children's natural and spontaneous play in natural environments, leads children to be lacking in environmental competence, self-worth, efficacy and resilience (Barratt-Hacking, Barratt & Scott, 2007). There is evidence to suggest that children can gain an understanding of environmental concepts, such as global warming, through active learning experiences (Knapp & Poff, 2001), including engaged discussions with adults (Ballantyne, Fien & Packer, 2001). Children as young as four years old have been shown to be capable of taking environmental action and influencing the wider community to act more sustainably through avenues such as writing letters to local community newspapers and modelling sustainable practices, such as water-saving, to their parents (Gambino, Davis & Rowntree, 2009).

Field experiences can benefit from pre-orientation activities at school which aim to provide children with knowledge and motivation. The field experiences themselves can engage children in learning through play, drama, story-telling and problem solving. Follow-up tasks, such as group discussions, writing tasks, or home/class projects encourage further reflection. Personal experiences create connections for children and develop their attitudes of care and concern towards

the environment (Gambino, Davis & Rowntree, 2009). Developing such attitudes are considered a key aspect of EfS.

By involving students in local environmental action, they can develop a deeper understanding of the everyday local environment and its links with other environments. Students can use research findings to formulate and pursue their aspirations for the local environment, for people and wildlife. They can also develop their capacity as researchers and as local citizens by applying research skills and findings to their current and future roles as consumers, residents, employees, stakeholders and voters (Barrett-Hacking, Barrett & Scott, 2007). Critical thinking and taking action on relevant issues are key aspects of EfS that lead to empowered citizens (Tilbury, 1995).

3.5.2 Teachers as enablers of environmental change – the role of professional learning in EfS

If education is going to enable students to think and act sustainably, then teacher education needs to be given consideration. If one considers the adage, ‘we can’t teach what we don’t know’, then developing teacher’s knowledge of EfS is instrumental for re-thinking education that supports sustainable living (Buchanan, 2013; Perry, 2013; Redman, 2013). Educating for sustainability is not limited to increased content knowledge, it also encompasses different forms of knowledge that embrace the normative, dynamic and action-based nature of sustainability (Redman, 2013). Teachers need to be in a position to give students an active voice and promote responsible citizenry with respect to sustainability. However, many education and teacher training programmes concentrate primarily on knowledge (the recall of information and facts), over the social components of change and action (Borko & Putnam, 1995; Redman, 2013). Teacher support in EfS needs to be present at a variety of levels, firstly at the ‘grassroots’ level, where there are challenges of an overcrowded curriculum, insufficient teacher knowledge and a need for training opportunities (Dyment & Hill, 2015). Secondly, support for teachers needs to be at the administrative level, where there is a significant focus on the need for quantitative testing of numeracy and literacy. And thirdly, there are possible conceptual barriers to teaching EfS, whereby conflicts may arise

between sustainability education theory and school practices (Dyment & Hill, 2015).

Teaching is a complex activity shaped by teachers' knowledge and their beliefs about what is important to teach, how students learn, how to manage student behaviour and meet external demands (Borko & Putnam, 1995; Timperley, Wilson, Barrar & Fung, 2008). When integrating EfS into a school, changes in the way teachers teach and the way they learned to teach may be called for (Borko & Putnam, 1995). In order for effective teacher learning to take place, it is important to set up conditions that are responsive to the ways in which teachers learn, such as: engaging learner's prior conceptions about how the world works; developing deep factual and conceptual knowledge, organised into frameworks that allow for retrieval and application, and promoting metacognitive and self-regulatory processes that help learners develop goals and then monitor their progress towards them. It is also important to recognise that professional learning is strongly shaped by the classroom in which a teacher teaches, which is in turn strongly influenced by the wider school culture and the community and society in which the school is situated. Additionally, teachers' daily experiences in the context of their practice shape their understandings, and their understandings shape their experiences (Timperley, et al., 2008).

While many teachers are keen to implement EfS in primary schools, a number lack the confidence, skills and knowledge to do so successfully (Bolstad et al, 2015). It can be helpful for teachers to understand the elements of sustainability education as emergent on different levels. Sustainability education can arise from the immediate materiality of the school grounds. It is also a collaborative and community-based practice that employs creative processes for problem solving and through inquiry learning. Involving the wider community and creating connections, networks and partnerships can help teachers to find innovative resources and expertise to expand their own, and their students' understanding of sustainability (Green & Somerville, 2005).

Teacher professional learning experiences can provide useful support for integrating EfS into school practices (Bolstad et al., 2015; Cowie & Eames, 2004).

In order for professional learning experiences to be useful, there needs to be a clear notion of the purpose of the activities that the teachers are engaging in during the session, in particular, questions such as ‘why are we doing this?’ and ‘what do we hope to accomplish?’ need to be addressed (Guskey, 2014). Guskey suggests a ‘backward planning approach’ to productive teacher professional learning, beginning at the proposed outcomes and then working backward to the processes that get there. The order of steps for professional learning planning thus becomes: student learning outcomes; new practices to be implemented; needed organisational support; desired educator knowledge and skills; and optimal professional learning activities (Guskey, 2014).

In helping teachers to develop their professional skills, a number of key principles have been demonstrated to have a positive impact on valued student outcomes (Timperley, Wilson, Barrar & Fung, 2008):

- Within an EfS context, professional learning experiences need to focus on the links between particular EfS teaching activities, the ways different groups of students respond, and what the students actually learn about sustainability. The knowledge and skills developed by teachers are those that have been established as effective in achieving valued student outcomes with respect to sustainability.
- Teachers need EfS knowledge and skills, which promotes deep teacher learning and effective changes in practice. Information about what students need to know about EfS and how to apply the knowledge is used to identify what teachers need to know and do. Teachers then respond to the key question: ‘what do we as teachers need to learn to promote the learning of our students in EfS?’ Teachers need multiple opportunities to absorb new information about EfS and translate it into practice: teacher learning is cyclical rather than linear.
- Professional learning in EfS requires different approaches depending on whether or not new ideas are consistent with the understandings that underpin current practice. Professional learning provides opportunities to process new learning with others, which can help teachers to integrate EfS into existing practice. The engagement of expertise external to the group

of participating teachers, e.g. an EfS Facilitator is necessary because it requires teachers to learn and think in different ways. Sustained improvement in student outcomes with respect to EfS needs teachers to have sound relevant theoretical knowledge, evidence-informed inquiry skills and supportive organisational conditions. The sustainability of the teaching depends on what happens during the professional learning experience and on the organisational conditions that are in place when the external support is withdrawn.

- Educational leaders have a key role in promoting and developing professional learning about EfS and development opportunities for teachers. It is important that leaders are actively involved in the teachers' professional learning (Timperly, et al., 2008).

Leadership and direction is necessary to embed EfS into the whole school system. Leadership for change may need to be transformative and reflective in nature, and critical leaders may be called upon to destabilise the *status quo* by challenging current assumptions by exerting 'deep', as opposed to 'shallow' leadership (Buchanan, 2013).

3.5.3 Supporting change - school leadership and EfS

The forms of leadership that are created within many current schooling systems rely on and reinforce an understanding of progress, which is the antithesis of values inherent in EfS. It is a school leader's role to challenge the existing paradigm within their own learning community, and to support whole school transformation towards sustainability: in teaching and learning and the curriculum; in their leadership of the school as an organisation; and in their relations with the wider community (Carr, 2016).

'Traditional' leadership views of a single leader controlling all individuals under their authority are considered unsustainable on a personal level, and help reinforce the narrative of power and control. By attributing success or failure to one individual in a school, staff may become over-reliant on leadership and disempowered (Carr, 2016). As a consequence of this, changes that have been

implemented during the leaders' tenure are often lost once they leave (Carr, 2016). In contrast, EfS requires a leader to focus on three functions of leading sustainably: (1) Distributing responsibility so that teachers can explore, challenge and enquire; (2) Create conditions that empower rather than control; and (3) Enable children to grow as capable, inquisitive, and connected decision-makers (Carr, 2016). The concept of distributed leadership shares leadership roles across multiple people and situations (Timperley, 2005).

The concept of distributed leadership focuses on the development and support of a web of interrelationships and connections, where leaders, including lead teachers are inspirational and able to support others to believe in what they can achieve themselves (Pepper & Wildy, 2008). The term 'sustainable leadership' represents a shift to capture and merge contemporary leadership with sustainability with three key aspects: (1) leading learning; (2) distributed leadership and (3) succession planning (Hargreaves & Fink, 2003, as cited in Pepper & Wildy, 2008).

Four themes can be conceptualised within sustainable leadership: understanding sustainability, imagining the future, building relationships, and taking action (Pepper & Wildy, 2008). These concepts of sustainable leadership parallel a number key concepts of EfS, such as knowledge and understanding, futures focus, issues based and action competence (Ministry of Education, 2017; Tilbury, 1995). Pepper and Wildy (2008, p.626) consider that "being a leader for sustainability requires a combination of deep knowledge for sustainability; the forward thinking and ability to imagine a different future; the interpersonal and networking skills to build strong relationships; and the energy and capability of taking action."

While distributed leadership has gained prominence in contemporary schools in recent years, it may be argued that the positioning of leadership within the expectations of the role of every teacher may not necessarily reflect the realities of teachers' professional aspirations, identities and practices (Torrance, 2013). Torrance (2013) has suggested that, in practice, distributed leadership is often more complex than represented, challenging five generally held assumptions in the theoretical, policy and practice frames:

- The assumption that every staff member is able to lead
- The assumption that every staff member wishes to lead
- The assumption that the leadership role is legitimised simply by the head teacher's endorsement
- The assumption that a distributed perspective occurs naturally
- The assumption that a distributed perspective is unproblematic

Torrance (2013) further proposes that, other terms be used instead of 'distributed leadership', such as 'hybrid leadership', reflecting a constantly shifting leadership mix within the division of labour that operates in schools; or 'parallel leadership', conceptualising a process whereby teacher leaders and their principals engage in collective action to develop the schools capacity. In exercising both instructional and adaptive leadership a principal can enable their teachers to learn from their context and experience individually and collectively as communities of learners. Additionally, the modification of school structures to allow for increased collaboration and more effective communication can assist in the development and sustainability of professional learning communities that have a shared vision and focus on student achievement (Byrne-Jimenez & Orr, 2012). A collaborative approach to leadership recognises equity amongst staff and may foster positive relationships which is a key aspect of EfS (MoE, 2017).

Schools can form and foster collaborative relationships with the local community to better meet their goals and objectives. Successful schools establish a strategic vision and a plan that reflects that mission and those goals. A skilful principal has the responsibility of ensuring community partnerships are unified and cohesive, bringing an array of new and useful resources to the school (Frey & Pumpian, 2006). The outcome of a collaborative relationship between school and community can be described as 'transformative'. The path to a transformative relationship includes: (1) Inquiry - where partners seek to learn about one another; (2) Engagement - where partners identify common goals for collaboration; (3) Partnership – where each partner uses their expertise and resources to achieve agreed-upon goals; (4) Transformation – where learning partners share their learning with others. An iterative cycle of inquiry, engagement, partnership and

transformation occurs as partners engage in new inquiries, develop goals, establish accountability methods and communicate with teachers, students, families and the larger community. A school modelling sustainability demonstrates all of these qualities throughout the school system (Henderson & Tilbury, 2004).

The attitude of school principals towards EfS determines its position in the curriculum, the amount of professional development available to teachers, and the prioritisation of collaboration between the school and community. The following dimensions of school leadership are considered conducive to integrating global social issues into pedagogical practices: distributed leadership, a shared vision of the school's goals, and attention to wider social issues in the local community and globally (Simovska & Prosch, 2016). These dimensions reflect the paradigm shift debated in the general school leadership literature and underline the shift from instrumental to transformative leadership (Hallinger, 2010).

Leadership is key to managing change, such as a school-wide movement towards a EfS pedagogy. Five components of leadership represent independent but mutually reinforcing forces for positive change (Fullan, 2001). Firstly, 'moral purpose' refers to acting with the intention of making a positive difference in the lives of those under one's leadership. A second component of leadership is for leaders to understand the change process: that the goal is not to innovate the most; that it is not enough to have the best ideas; to appreciate the early difficulties of trying something new; to redefine resistance as a positive force; that re-culturing is part of the process; and that change does not occur from a checklist, it is more complex. A third factor in successful change innovations is that as relationships between the players improve, effective leaders constantly foster purposeful interaction and problem solving. Fourthly, successful leaders commit themselves to constantly generating and sharing knowledge inside and outside the organisation. The role of knowledge relates to the three previous themes, that is, that people will not voluntarily share knowledge unless they feel some moral commitment to do so, people will not share unless the dynamics of change favour exchange, and data without relationships can cause an information glut. Finally,

coherence making during the process of change is a continual pursuit, in order to keep the process flowing but to prevent chaos from arising (Fullan, 2001).

Leadership that places high value on sustainability is a key aspect of a whole school approach to EfS (Henderson & Tilbury, 2004). The success of the school-wide move towards change may depend on the school leaders' understanding of change and how to enact this, and also their understanding of EfS (Simovska & Prosch, 2016).

3.5.4 Agents of change summary

Actively involving children in participating in EfS action is a key element in promoting a life-long disposition towards caring for the environment (Arlemalm-Hagser, & Davis, 2014; Hart, 1997). When students are given the opportunity to participate in sustainable actions it gives them a say in deciding the future of their community (Birdsall, 2010). For people to participate effectively in sustainable actions, they need relevant knowledge, skills and positive attitudes and values towards the environment (Birdsall, 2010). Hart's (1997) ladder outlines way of thinking about children's participation, and shows a graduated approach to participation through different levels, involving children as increasingly active participants for change, to the highest 'rung' where decisions are child-initiated and shared with adults. A three part model has also been proposed to provide a 'simplified' tool for teachers to assist students' learning about the nature of action: students learn 'about' action, 'through' action, and 'from' action (Birdsall, 2010).

If education is going to enable students to think and act sustainably, then teacher education needs to be given consideration. Developing teacher's knowledge of EfS is instrumental for re-thinking education that supports sustainable living (Buchanan, 2013; Perry, 2013; Redman, 2013). Educating for sustainability encompasses different forms of knowledge that embrace the normative, dynamic and action-based nature of sustainability (Redman, 2013). Teachers need to be in a position to give students an active voice and promote responsible citizenry with respect to sustainability. Teacher support in EfS needs to be present at a variety of levels: at the 'grassroots' level, where there are challenges of an overcrowded

curriculum, insufficient teacher knowledge and a need for training opportunities; at the administrative level, where there is a significant focus on the need for quantitative testing of numeracy and literacy; and where there are possible conceptual barriers to teaching EfS, where conflicts may arise between sustainability education theory and school practices (Dyment & Hill, 2015).

It is a school leader's role to challenge the existing paradigm within their own learning community, and to support whole school transformation towards sustainability: in teaching and learning and the curriculum; in their leadership of the school as an organisation; and in their relations with the wider community (Carr, 2016). The attitude of the school principal towards sustainability education determines its position in the curriculum, the amount of professional development available to teachers, and the prioritisation of collaboration between the school and community (Simovska & Prosch, 2016). EfS requires a leader to focus on three functions of leading sustainably: distributing responsibility; creating conditions that empower rather than control; and enabling children to grow as capable, inquisitive, and connected decision-makers (Carr, 2016). Four themes can be conceptualised within sustainable leadership: understanding sustainability, imagining the future, building relationships, and taking action (Pepper and Wildy, 2008).

Leadership is key to managing change, such as a school-wide movement towards a sustainability pedagogy. Leaders need to understand the change process: that the goal is not to innovate the most; that it is not enough to have the best ideas; to appreciate the early difficulties of trying something new; to redefine resistance as a positive force; that re-culturing is part of the process; and that change does not occur from a checklist, it is more complex. Successful leaders commit themselves to constantly generating and sharing knowledge inside and outside the organisation (Fullan, 2001).

3.6 Chapter summary

Modern education has tended to perpetuate the dominant cultural norms of individualism, competition and independence that have furthered the

industrialisation of the planet and the associated environmental problems (Sipos, Battisti & Grimm, 2008; Sterling, 1996). We need to find new approaches to education that develop critical thinking and action competence, key aspects of a transformative educational concept such as EfS (Birdsall, 2010).

Transformative learning is an overarching concept which develops autonomous thinking (Cranton, 1994; Merriam & Ntseane, 2008; Merriam, 2004; Nazzari, McAdams & Roy, 2005) and empowers students to challenge existing assumptions (Merriam & Ntseane, 2008; Merriam, 2004; Share, 2007; Sipos, Battisti & Grimm, 2008). It has been suggested that the purpose of education needs be to *transform* society towards a more sustainable future by imparting goals that contribute to sustainability (Arlemalm-Hagser & Davis, 2014; Bolstad, 2003; Davis & Cooke, 2007; Dymont & Hill, 2015; Huckle & Sterling, 1996; Sterling, 2001).

Instrumental learning in EfS has specific goals with respect to a specific behaviour, and targets a specific group to address with these goals (Wals et al., 2008). The emancipatory approach, in contrast, attempts to engage participants in active communication in order to establish mutual objectives, shared meanings and a joint plan of action which aims to improve sustainable practices. This approach aims for long term changes relating to public support, engagement and involvement (Wals et al., 2008).

The traditional, science-oriented approach to environmental education has been criticised for leading to knowledge about the environment and associated problems, but not leading to environmental action (Jensen & Schnack, 1997). Changing perspectives in EfS have led to many EfS programmes in schools including an 'action-oriented' dimension. An action is specifically targeted towards the solution of a problem that is being focussed on, through the development of action competence.

When transforming a schooling system, the whole system needs to be transformed in a sustainable way, rather than in a piecemeal way (Duffy, 2006). The process of transforming a school system requires designing and implementing an entirely

new paradigm of education, rather than changing a piece within the existing paradigm (Reigeluth, 2006).

One of the many challenges faced by systems that want to make major changes in their educational practices is the difficulty of dealing with the current beliefs, values, and attitudes of those involved (Forlin, 2007). The participants must consider the new changes to be realistic. Changes must also be manageable within other school constraints, it cannot be 'added on' to what is happening at the moment, it must be a change in philosophy that is embedded across all aspects of the school's culture policy and practices (Forlin, 2007).

When students are given the opportunity to participate in sustainable actions it gives them a say in deciding the future of their community (Birdsall, 2010). Students can be empowered to be agents of change by developing knowledge relating to sustainability and participating in active learning experiences (Arlemalm-Hagser, and Davis, 2014; Hart, 1997). Professional learning and development for teachers can assist them to become agents of change in the classroom. Developing teacher's knowledge of EfS is instrumental for re-thinking education that supports sustainable living (Buchanan, 2013; Perry, 2013; Redman, 2013). Leadership is key to managing change, such as a school-wide movement towards a sustainability pedagogy. The attitude of the school principal towards sustainability education determines its position in the curriculum, the amount of professional development available to teachers, and the prioritisation of collaboration between the school and community (Simovska & Prosch, 2016). It is a school leader's role to challenge the existing paradigm within their own learning community, and to support whole school transformation towards sustainability: in teaching and learning and the curriculum; in their leadership of the school as an organisation; and in their relations with the wider community (Carr, 2016).

These ideas surrounding theories of change, and those in chapter two derived from the literature around EfS and a whole school approach to EfS formed the theoretical framework that guided this study. This study seeks to inform a gap in the literature by addressing a lack of information surrounding a longitudinal

studies of whole school approaches to EfS, and the factors which enable and inhibit their development. The following chapter presents the methodology for the research.

Chapter 4

Methodology

4.1 Introduction

As discussed in literature review, chapters two and three, there is a need for research in the development of a whole school approach to education for sustainability that is underpinned by learning and change theory. This research is needed to further extend the body of knowledge surrounding the development of a whole school approach to EfS.

This chapter provides a description of how the research in the study was conducted. It provides background to the methodological approach used in the research, and the methods chosen for data analysis and collection. It also includes a description of the research design, including sampling, data collection and analysis, and discusses the issues of trustworthiness and ethics.

4.2 The research questions

This study contributes to the research need by addressing the following questions:

1. How can a whole school approach to EfS be planned in a New Zealand primary school?
2. How was a whole school approach to EfS implemented in a New Zealand Primary school?
3. What are the outcomes of the whole school approach to education for sustainability in terms of student learning, teacher development and school change?

4.3 Methodology

The research process is defined by three dimensions: the personal biography of the researcher (e.g. ethnicity, gender, cultural background); the framework (theory, ontology) that specifies a set of questions (epistemology); and the specific ways in which these questions are examined (Denzin & Lincoln, 2003). Methodology can be described as the examination of a specific set of questions by the researcher within the chosen framework (Denzin & Lincoln, p. 30) The methodology indicates the tools for data collection and influences the data analysis (Cohen et al., 2011).

The choice of methodology used is determined by the questions that are being asked and the relevance to the purpose of the inquiry (Patton, 1990). Broadly speaking, there are two, “opposing” views of reality in educational research: positivist and post-positivist views (Lather, 1992; Cohen et al., 2011). These two views arise from different conceptions of social reality and of individual and social behaviour (Cohen et al., 2011).

The positivist view can be described as the traditional research approach that stems from the physical sciences in the 19th century and prior (Cohen et al., 2011; Eisner, 1993; Onwuegbuzie, 2000). Positivist views are concerned with the discovery and prediction of natural and universal laws regulating and determining individual and social behaviour (Cohen et al., 2011; Donmoyer, 2006; Lather, 1992; Onwuegbuzie, 2000). A positivist researcher generates hypotheses prior to the design of an experiment which aims to prove or disprove the hypothesis. A positivist research approach requires the researcher to be an observer rather than a participant in the study (Cohen et al., 2011). A positivist approach dictates a realist ontology (the theory of being which concerns the very nature of the social phenomena being investigated) (Alerby, 2000; Cohen et al., 2011; Maki, 2001); an objectivist epistemology (nature and form of knowledge, how can it be acquired, and how can it be communicated to others) (Cohen et al., 2011; Groenewald, 2005; Many, Howard & Hoge, 2002; Lather, 1992; Siegel, 2006); and an experimental and manipulative methodology (Guba & Lincoln, 1989).

As society entered the 20th century, social scientists questioned the suitability of the positivist approach when studying social and human issues (Onwuegbuzie, 2000). The challenges to positivism resulted in a paradigm shift away from the objective, scientific approach, towards a plethora of naturalistic, subjective approaches, the so-called post-positivist approaches (Cohen et al., 2011; Eisner, 1993; Lather, 1992; Onwuegbuzie, 2000). Post-positivist views explain and describe how people differ from each other whilst maintaining the traditionalist integrity of the investigation (Cohen et al., 2011). Post-positivist views aim to understand (e.g. interpretivism and constructivism), emancipate (e.g. feminism) or deconstruct (e.g. post-structuralism) rather than predict (positivism) (Lather, 1992). In particular, interpretive researchers set out to understand the individual's interpretation of the world around them. The post-positive approach views knowledge in terms of social construction of reality. It sees knowledge as being subjective and having to be personally experienced and constructed (Cohen et al., 2000; Many et al., 2002). Research can be guided by a framework, but theory is emergent and arises from particular situations, i.e. theory follows the research rather than preceding it (Cohen et al., 2011). A post-positivist approach dictates a nominalist ontology; an subjectivist epistemology and a rich, descriptive methodology (Guba & Lincoln, 1989).

Critics of the interpretivist paradigm argue that interpretivists have gone too far in abandoning the scientific procedures of verification and fail to deliver generalisable information that could be used to develop the understanding of social phenomena (Argyle, 1978; Bernstein, 1974; Cohen et al., 2011) Additional criticisms include the concern that interpretive research can isolate the situation in which the researcher is located, and issues such as power structures, relating to either the situation or the researcher, that may influence the participants, are not accounted for. Interpretive researchers argue that this criticism can be overcome by providing a detailed description of the context of the situation and acknowledgement by the researcher of their own position and power when analysing their data and reporting their research (Cohen et al., 2011).

As a researcher, my own previous education was in the field of science, and I had been trained in the scientific method, i.e. positivism. This background suggested a quantitative approach to this study, whereby I would pose questions that could be verified or falsified by scientific methods, and analysed by statistical methods which could be rigorously controlled under replicable conditions. However, it was apparent that this approach was not applicable to my research as it did not recognise the unique and individual nature of the participants and events which would unfold during the development of the whole school approach to EfS. A positivist approach would also not allow me to answer my research questions, whereby I wanted to identify themes relating to the development of a whole school approach from the data, within the given framework. An interpretivist approach would allow me to observe the development of a whole school approach in its natural state, without any intervention of, or manipulation by, the researcher. It would also allow for multiple interpretations and perspectives of EfS and the whole school approach (Cohen et al., 2011). An interpretivist approach recognises that people are deliberate in their actions and act intentionally, and also that they make meanings through their activities. In the case of this research, participants' meanings relating to implementing a whole school approach to EfS were of interest. It also recognises that situations are fluid and change over time and are affected by context (Cohen, et al, 2011). In the case of this research, I was interested in how the development of a whole school approach to EfS, and the perceptions of the participants, changed over time.

4.4 Research approaches

The research approach is governed by the notion of 'fitness for purpose', i.e. the purposes of the research determine the methodology and design of the research. The choice of paradigms informs and underpins the planning of the research, in this case an interpretive paradigm that rests in part on a socially constructed ontology and on an epistemology that recognises multiple realities and the importance of understanding a situation through the eyes of the participants (Cohen et al., 2011). Two specific research approaches within interpretivism which relate to this study include case studies and longitudinal studies, and are summarised below.

4.4.1 Case study research

A case study is a specific instance that illustrates a more general principle and provides a unique example of real people in real situations. It allows readers to understand ideas more clearly than simply by presenting them with abstract theories or principles (Cohen et al., 2011). A case study is not a methodological choice, but a choice of what is to be studied (Stake, 2003).

The purpose of a case study is “to portray, analyse, and interpret the uniqueness of real individuals and situations through accessible accounts”, and “to present and represent, reality – to give a sense of ‘being there’” (Cohen et al., 2011, p. 129). Case studies ask questions around what can be learned from the particular case (Stake, 2003). They focus on bounded phenomena and systems. Key features of case studies include in-depth analysis and portrayal that is interpretive and inferential. They are also characterised by being subjective, descriptive, analytical and complex. They aim to understand the particular situation in its specific complexity. In a case study the researcher is integrally involved in the case and the case study may be influenced by the personality of the researcher (Cohen et al., 2011; Creswell, 2005).

Case studies are characterised by providing in-depth, detailed data from a wide data source, e.g. observations, interviews and document analysis (Fox-Parrish & Jurin, 2008). A case study is non-interventionist and can include participant and non-participant observation. It is also empathetic and engages in holistic treatment of phenomena (Cohen et al., 2011; Creswell, 2005; Fox-Parrish & Jurin, 2008). Data are analysed and interpreted in detail and themes can be developed from the case. Reporting the data can be based primarily on the description of the case, or description, analysis and interpretation can be weighted according to preference. The researcher can be objective or subjective in their reporting (Creswell, 2005). The case study discusses ‘what can be learned from the single case?’ (Cohen et al., 2011; Stake, 2003). The more the object of study (i.e. the ‘case’) is a specific, unique and bounded system, the greater the usefulness of the insights that emerge (Creswell, 2005; Stake, 2003).

This research takes the form of a case study as it investigates various aspects of one school's unique experiences when integrating a whole school approach to EfS. Various methods of data collection, such as observations, interviews and document analysis were used to create an in-depth analysis and portrayal of the experiences of the study schools' particular situation in its specific complexity (Cohen et al., 2011; Creswell, 2005)

4.4.2 Longitudinal studies

The research questions for this study were partly involved with the development of a whole school approach to EfS in a school over time, i.e. a longitudinal study. The term longitudinal can be used to describe a variety of studies that are conducted over a period of time. Longitudinal studies can be of the survey type or other types, such as a case study, and gather data over an extended period of time (Cohen et al., 2011). A longitudinal study may follow a group of individuals over time, i.e. a 'cohort' study, or may study different respondents at different points in time, i.e. a 'cross-sectional' study. Longitudinal studies seek individual narratives that require the continuity that emerges over time and within individuals (Cohen et al., 2011).

It is important in a longitudinal study to decide when and how frequently to collect data, and this is informed by issues around fitness of purpose and practicability (Cohen et al., 2011). Thomson and Holland (2003) have indicated that there can be the problem of continual openness in the analysis of longitudinal research as there may never be complete closure on data analysis, with added collections of data challenging earlier interpretations made by researchers.

In this study the longitudinal research approach allowed for observation of the unfolding of the process of the development of the whole school approach in the school over time. It also allowed for an opportunity to follow a group of individuals and to observe any changes in their understanding or teaching practices over the course of the first year of the integration of the whole school approach to EfS.

4.4.3 Ethnographic research and prolonged engagement

Ethnographic research aims to portray events in subjects' terms, it is subjective and reports on multiple perspectives. It focuses on the perceptions and views of participants, and on issues as they emerge over time. Ethnographic research is context specific, responsive to emergent issues, and allows room for judgements and multiple perspectives. In ethnographic research a wide database is collected over a long period of time (Cohen et al., 2011; Creswell, 2005). Ethnography can be a powerful and unique approach to obtaining an in-depth, contextualised understanding of participant's perspectives. A hallmark of ethnographic research is sustained engagement in participants' lives (Creswell, 2005; Haight, Kayama & Korang- Okrah, 2014).

My research into the development of a whole school approach was carried out over the first year of integration of EfS, with a follow-up visit taking place about nine months after the conclusion of the first year. While the research displayed aspects of ethnography, such as reporting on multiple perspectives and views of participants, and also a degree of prolonged engagement, it cannot be considered 'true' ethnographic research as the study did not fulfil enough of the criteria for ethnography.

4.5 Methods of Data Collection and Analysis

Different methods of data collection can produce data that is either qualitative or quantitative in nature. Methods that produce quantitative data lead to numerical analysis. This type of data is seen as being "hard" (Cohen, Manion & Morrision, 2011; Onwuegbuzie, 2000; Onwuegbuzie & Leech, 2005). Methods that produce qualitative data lead to more descriptive analysis, for example of interview transcripts. Therefore, qualitative data is seen as being rich and descriptive in terms of meanings and participants interpretations (Cohen et al., 2011; Onwuegbuzie, 2000; Onwuegbuzie & Leech, 2005).

It follows that the types of knowledge produced from research are dependent on the data collection methods and data collected. For example, a survey using

Likert scale rankings may provide an overall quantitative view of a learning context, but interviews using open-ended questions may reveal the description behind what is actually going on in that situation (Coll, Pinyonattagarn & Pramoolsook, 2003). And so, the research question should lead the methods (and the subsequent analysis) in such a way that the results actually reflect what one wants to find out (Alerby, 2000; Johnson & Onwuegbuzie, 2004).

The choice of methodology determines the choice of methods of inquiry, as the method(s) chosen must be able to provide data that can be analysed in fitting with the methodological approach. In this study, methods that generated qualitative data were the most appropriate for investigating the aspects of a whole school approach to EfS as outlined in the research questions. The rich descriptions and detailed information provided by qualitative data were considered to provide a greater depth of understanding of the process of the development of a whole school approach to EfS. These methods are discussed below.

4.5.1 Observations

Observations are a widely used means of data collection and can take many forms. The researcher can take one of several different roles when conducting observations:

- The complete participant – the researcher is a member of the group whose identity as a researcher is concealed.
- The participant-as-observer – the researcher is a member of the group whose position as researcher is known to the group and is also a participant in the activities of the group.
- The observer-as-participant – the researcher is not a member of the group, but who may participate a little in the group's activities. Their role is known to the group but they are as unobtrusive as possible.
- The complete observer – the researcher is detached from the group and while they are not covert, they are not noticed by the group they are observing.

(Cohen et al., 2011)

In this study, I took the role of observer-as-participant as I was known to the staff and students. My presence was acknowledged in the staff meetings and classroom observations, and on occasion I responded in a neutral manner to questions asked to me by students. I did not lead discussions or interactions, or actively influence in any way during data collection.

A distinctive feature of observation is that it offers the researcher the chance to gather 'live' data from the naturally occurring situation, rather than relying on information being relayed second-hand. Specific aspects of observations may include facts, events, behaviour or what is said and by whom (Cohen et al., 2011; Creswell, 2005). Observations can also give the researcher the opportunity to discover things that the participants may not freely talk about in interview situations. Types of observations can lie on a continuum from structured to semi-structured and un-structured. Structured observation will already have its hypotheses decided and will use the observational data to confirm or refute these. The analysis of structured observations often involves counting frequencies, or observing patterns. Semi- and un-structured observation will be hypothesis generating rather than hypothesis testing (Cohen et al., 2011). For these less structured observations, tools of qualitative analysis such as coding and categorising, narrative accounts, and thematic analysis may be used (Cohen et al., 2011).

In this study, I chose to use unstructured observations whereby I sat slightly back from the meeting table in staff meetings (held in a meeting room adjoining the staffroom) and classroom sessions with the EfS Facilitator. I wrote a detailed, hand written, description for each observation, including notes of what was happening at the time, what was said and by whom (either verbatim quotes or the essence of what was said). Information was recorded continuously during the meetings. During these meetings I endeavoured to remain as unobtrusive as possible. Unstructured observations allowed me to observe and record the participants in a naturalistic setting which would provide for a more holistic understanding of what was taking place in the setting.

4.5.2 Interviews

Interviews are widely used in qualitative research. The interview allows the interviewee to “discuss their interpretations of the world in which they live, and to express how they regard situations from their point of view” (Cohen et al., 2011, p. 409). An interview is not an ordinary, everyday conversation, it has a specific purpose and is a specifically planned event rather than a naturally occurring situation (Cohen et al., 2011; Fontana & Frey, 2003). The purpose of an interview may be:

- To evaluate or assess a person;
- To test or develop a hypothesis;
- To gather survey-type data;
- To establish respondents’ opinions.

Interviews used as a research tool can range from formal interviews in which set questions are asked and the answers are recorded on a standardised schedule, through less formal interviews (semi-structured) in which the interviewer is free to modify the sequence of questions, change or explain the wording, to a completely informal (unstructured) interview where the interviewer may have a number of key issues that they raise in a conversational style instead of having a set questionnaire (Cohen et al., 2011; Creswell, 2009; Fontana & Frey, 2003).

A semi-structured interview style with a flexible schedule was chosen for this study because it enabled me to focus on the research themes while giving participants the freedom to define and expand the issues in their own terms, and thus provide the opportunity to gain an insight into their world views (Lankshear & Knobel, 2004, as cited in Evans et al., 2012; Kvale, 1996).

An interview can be considered a social, interpersonal encounter, whereby the interviewer is recommended to bear in mind the socio-cultural context of the interaction. The interviewer must conduct the interview carefully and sensitively in order for the participant to feel secure enough to talk freely (Cohen et al.,

2011). Thus there can be several challenges to the validity of the interview method. There is the need to recognise the cognitive aspect of the interview, ensuring that the interviewer is suitably knowledgeable about the subject matter of the interview and that the interviewee does not feel threatened by lack of knowledge. The notion of power can present problems in the interview situation, with the interviewer potentially being seen as holding the greater 'power' over the interviewee during the interview (Cohen et al., 2011).

Interviewers must also be aware of the fact that respondents may give misinformation, be it intentionally or unintentionally (Cohen et al., 2011; Creswell, 2005). It is important to develop rapport with the interviewee whilst maintaining neutrality with respect to what the interviewee says (Cohen et al., 2011; Creswell, 2005; Fontana & Frey, 2003; Patton, 1990).

Interviews with children can present problems, such as the establishment of trust, choice of age-appropriate vocabulary, avoiding the interviewer being perceived as intimidating, keeping to the point of the question, and possible effects of non-verbal cues (Cohen et al., 2011).

The ethical dimension of the interview also needs to be considered, ensuring, for example, informed consent and guarantees of confidentiality. The issues of ethics also need to consider what are data and what are not, for example, if an interviewee reveals information after the interview is officially concluded, does this count as data? (Cohen et al., 2011).

Interviews can be one-on-one, or involve several participants. In this study I used one-on-one semi-structured interviews with two of the teaching staff, and the EfS Facilitator. These one-on-one interviews allowed me to collect detailed information from individuals in a private setting (a closed meeting room in the school administration block), without any external influence or interference from other individuals. I allowed the participants to read the questions as they were written on the page in order to assist their understanding. I then recorded their verbal responses on mini-cassette tapes which I later transcribed verbatim.

A focus group interview involves the collection of data through interviews with a group of people, often four to six. In a focus group the researcher asks a smaller number of questions and records responses from all the members of the group. Focus groups can be useful when the interaction among the participants is likely to produce the most useful information, and when the participants are familiar with and co-operative with each other (Creswell, 2005). In a focus group the interviewer must ensure that one person(s) does not dominate the group, and encourage quieter participants to be involved (Fontana & Frey, 2003). I conducted focus group sessions with groups of two or three students at a time, utilising a semi-structured interview format. The aim of this was to allow the students to discuss ideas with their peers in a 'secure', group environment.

4.5.3 Questionnaires

A questionnaire is a widely used and useful instrument for collecting information because of its ready availability to participants. The information obtained is often numerical but can also contain the option for open-ended questions (Cohen et al., 2011). The questionnaire used in this study presented adult (teacher) participants with ten open-ended questions. This allowed participants to respond in their own time using their own words. The questions were constructed in a way as to minimise redundant information and not to appear to require overly-long responses which may appear discouraging to participants (Cohen et al., 2011).

4.5.4 Document analysis

During the research process documents may be collected that are either public, such as newspapers, minutes of meetings, or official reports, or private, such as personal journals or diaries. Documents can represent a good source of text in the participants' own language and they may be ready for analysis without the required transcription that is required with observational and interview data (Creswell, 2012). However, documents can present difficulties by being hard to locate and obtain, or incomplete, inauthentic, inaccurate, or challenging to decipher if hand-written (Creswell, 2012). For my research I collected copies of written responses from students that resulted from various EfS-related tasks that

they engaged in. This type of data allows the researcher to obtain the thoughts of the students in their own words, and is an unobtrusive form of data collection. During my research I also collected documents given to the teachers by the EfS Facilitator, and these included EfS inquiry frameworks and action planner documents.

4.5.5 Data handling and analysis

Qualitative data analysis involves organising, accounting for, and explaining the data provided by the participants (Creswell, 2009; Cohen et al., 2011). The principle of fitness for purpose suggests that the researcher must be clear regarding what they want the data analysis to do as this will determine the kind of analysis that is undertaken. This in turn influences the way the data is written up (Cohen et al., 2011).

Miles and Huberman (1994) define ‘analysis’ as consisting of three concurrent flows of activity: data reduction, data display, and conclusion drawing/verification. Qualitative research frequently results in the collection of large quantities of written material (Cohen, Manion and Morrison, 2011). Data reduction refers to the process of “selecting, focusing, simplifying, abstracting and transforming the data” (Miles & Huberman, 1994, p.11) that arises from data sources such as observations and interviews. Data reduction occurs continuously throughout the research process as the researcher decides which conceptual framework, which instances to observe/collect data, which research questions to respond to, and which data collection methods to choose. Further data reduction occurs by summarising, coding and searching for themes. During the data reduction process it can be important not to separate the data from the context within which it occurs (Cohen et al., 2011; Creswell, 2009; Miles & Huberman, 1994).

Data display involves an organised, compressed assemblage of information that allows conclusions to be drawn. The design of the display is an analytical process which can occur in conjunction with data reduction (Miles & Huberman, 1994).

Content analysis is a set of methods for systematically coding and analysing qualitative data (Bernard, 2013; Cohen, et al., 2011). Content analysis has been differentiated from thematic analysis on the basis that content analysis involves the identification of codes prior to seeking them in the data, and that thematic analysis involves the identification of codes from the data after it has been collected (Liamputtong & Ezzy, 2005). The identification of themes provides the complexity of a story and adds depth to the insight about understanding individual experiences or observations (Creswell, 2012). The principles of content analysis require that the codes or categories are developed prior to searching for them in the data, the sample to be categorised is then selected, then the number of times the categories occur is counted or recorded (Liamputtong & Ezzy, 2005).

The coding process in my research involved generating a list of codes based on the framework for developing a whole school approach to EfS as described by Eames, Wilson-Hill & Barker (2013). Bearing these codes in mind I systematically read through all the data that I collected and ascribed each 'new' piece of information (e.g. observation, interview comment, written information from a document) a code. The coded data from each observation session, interview, and written document was organised into tables consisting of three columns: one column for the date the data was collected, one for the code, and one for the piece of data that the code pertained to. Any information that did not appear to fit within these codes was ascribed a new code based on what I considered the information to represent. Many data items initially appeared to represent multiple codes, and so I used discretion to determine which code described the data with the most accuracy. Each data table was categorised by data collection type and what stage of the development of a whole school approach it related to, i.e. the planning stage, implementation stage or the outcomes stage. Following the coding procedure I reviewed the data items within each 'stage' of the development of the whole school approach and grouped together in a separate document data items that had corresponding themes. These related themes were then grouped together under one of each of the four sub-categories within each of the three stages of whole school development, e.g. 'people', 'planning', 'programmes' and 'place'. Once grouped under these sub-categories the data was arranged and re-written (where necessary for clarity) in

such a way that the themes the data represented were intended to be clear to the reader.

4.6 Data collection

The collection of data occurred during approximately the first year of implementation of the whole school approach to EfS, from September 2008, though to December 2009, with an additional, follow-up data collection focus group in September 2010. Meetings between the EfS Facilitator and various staff members took place at intervals as determined by the EfS Facilitator and Principal during this time, and I attended and observed them whenever possible.

Staff were interviewed at selected times during the year, and care was taken not to appear to ‘overload’ particular staff members with what may have been perceived as ‘excessive’ questioning.

4.6.1 The research school

The research school, ‘Ferndale School’ (pseudonym) was selected for my research because it was in the very early stages of considering integrating EfS, and thus was a suitable candidate for studying. The school was rural and made up of four classrooms and a central administration block. The school buildings were at least 30 years old, and the interiors of the classrooms were starting to show signs of wear and tear due to age. At the beginning of the study the school replaced its ‘old’ administration block with a new building comprising a school office, staffroom, meeting rooms and sick bay. The school grounds were comprised of a purpose-built playground, a concreted area for playing on, a small grass playing area near the classrooms, a large playing field at the back of the classrooms, and a section of native bush, also at the rear of the school grounds. The grounds in general were relatively un-developed at the beginning of the study.

There were about 80 students at the school at the time of the study, ranging in age from Year 0/1 (five year olds) to Year 6 (10 year olds). The school was decile-rated level 6 (a measure of socio-economic rating of the community where 1 is

low and 10 is high), and was made up of roughly 40% NZ European, 46% Maori/Pacific Island and 14% other ethnicities (Educationcounts 2015).

Ferndale School had four full-time teachers at the time of the study, two or three support staff, and a principal. Each of the four teachers taught a mixed level class. Three of the four classroom teachers, and the principal, participated in the study. The three classroom teachers who agreed to be part of the research were: ‘Brianna’ (mid-30s) who taught Year2/Year 3 students; ‘Jessica’ (mid-late 40s), who taught Year 3/Year 4 students; and ‘Sarah’ (late 20s-early 30s) who taught Year 5/Year 6 students (all names used are pseudonyms). Brianna took the role of ‘lead EfS teacher’ during the implementation of the whole school approach. The new entrant/Year 1 teacher declined to be part of the study as she felt she was ‘too close to retirement’ and considered herself/her class to be not a significant contributor to their EfS programmes. The Principal, ‘Ally’, (late 40s-early 50s) was new to the school at the start of the school year.

The EfS Facilitator, ‘Beth’, (early - mid 60s) was an external individual who came into the school periodically to meet with staff, and lead several student learning sessions. She was employed by ‘Team Solutions’, one of New Zealand’s providers of professional development services for schools (part of the Faculty of Education and Social Work at the University of Auckland). The Facilitator was implementing the Enviroschools programme and utilising both their resources and those from other sources, e.g. work by Kath Murdoch (KathMurdoch, 2018).

4.7 The data collection procedure

Table 4.1 below shows a timeline of data collection methods and times as they occurred during the school’s first year of implementation of the whole school approach to EfS. The table is followed by a brief context for each data collection event.

Table 4.1 *Timeline of data collection at Ryelands School*

| Date | Data collection details | Participant(s) |
|----------------|--|---|
| August 2008 | Meeting observation (1.5 hours) (planning) | EfS Facilitator, Brianna (Lead EfS teacher), Ally (Principal), Sarah & Jessica |
| November 2008 | Meeting observation (1.5 hours) (planning) Inquiry, co-operative, experiential learning framework (Appendix 1) (planning) EfS whole school focus, Term 1 (Appendix 2) (planning) Planning an integrated inquiry: guide and proforma (Appendix 3) (planning) EfS planning sheet, planning an integrated inquiry (Appendix 4) (planning) | EfS Facilitator, Ally, Brianna |
| February 2009 | Formal interview (Appendix 8) (planning) Classroom observation EfS Facilitator (1hour) (implementation) Classroom observation EfS Facilitator (1hour) (implementation) Classroom observation EfS Facilitator (1hour) (implementation) | EfS Facilitator Class of Year 2/Year 3 students Class of Year 3/Year 4 students Class of Year 5/Year 6 students |
| March 2009 | Formal interviews (Appendix 5) (planning) Meeting observation (1.5 hours) (planning) PMI Vision Map tables (implementation) | Ally, Brianna EfS Facilitator, Brianna, Ally, Sarah & Jessica All students |
| April 2009 | Meeting observation (planning) Environmental action planners (Appendix 11) (planning) Summary of “Ryelands matters” meeting (Appendix 12) (planning) | EfS Facilitator, Brianna & Ally Teaching staff All teachers and 20 parents |
| May 2009 | Meeting observation (1.5 hours) (planning) | EfS Facilitator & Brianna (Ally, 0.5 hour only) |
| July 2009 | Semi-structured interviews (Appendix 6) (implementation) | Brianna, Jessica, Sarah |
| November 2009 | Student focus groups (Appendix 9) (Year 5/Year 6 students) (implementation) | Christie, Tayla & Katherine, Daniel, Janine, Tara, Regan, Molly, Jason & Ravi, Reece & Henry, Rose & Kylie, Siena & Devon |
| December 2009 | Formal interview (Appendix 8) (outcomes) Individual written questionnaires (Appendix 7) (outcomes) | EfS Facilitator Sarah, Jessica |
| September 2010 | Staff focus group – written responses (Appendix 10) (outcomes) | Ally, Brianna, Sarah, Jessica |

4.7.1 Outline of the data collection

Towards the end of August, 2008, I observed the meeting that the EfS Facilitator held with all of the staff at the school, excluding the New Entrant teacher who was not participating in EfS and did not attend any staff meetings with the EfS Facilitator. This meeting was held in the school library with no one else present. The purpose of this meeting was for the EfS Facilitator to present to the staff the idea of introducing a whole school approach to EfS into the school the following year. The lead EfS teacher (Brianna, who was acting principal at the time) was a key figure in bringing the EfS Facilitator into the school.

In November, 2008, the EfS Facilitator held a meeting with the new school principal (Ally) and the lead EfS teacher (again in the library, with no one else present) to give them assistance with planning the integration of EfS into the school practices, programmes and policies. During this meeting four documents to support planning integrated EfS inquiry in schools were given to the principal and teachers by the EfS Facilitator (see Appendices 1-4).

In February, 2009, the EfS Facilitator visited three of the four classrooms at the school for one hour at a time to introduce sustainability concepts to the students. The classroom teacher was present during the sessions but did not contribute to the discussions unless necessary for management purposes. I observed from the back of the classroom in each instance. I held a one-on-one formal interview with the EfS Facilitator (in a private meeting room at the school) after her sessions with the classes at the end of the school day. The interview was comprised of eight questions focussed on her thoughts on how well the school was going with its integration of EfS (See Appendix 8).

In March, 2009, I held two formal, one-on-one interviews with the school principal and lead EfS teacher. These meetings were held in a private meeting room at the school and consisted of 26 questions focussed on their knowledge and understanding of EfS and the concepts of 'People (and Participation)', 'Programmes', 'Practices' and 'Place' (see Appendix 5). Also in March I observed a staff meeting with the EfS Facilitator and all the staff in order to get

feedback on their progress with the integration of EfS and to assist them with further planning. This meeting was held in the staff room with other support staff regularly passing through the room and often stopping to talk to the principal. In addition, on one morning in March, all the students in the school were organised by teachers into three groups of mixed age students and taken to different parts of the school to talk about the 'PMI' (Positive, negative, improvement) table that they had to fill out. I chose one group (for no particular reason) to sit with and observe. The larger group was then divided into smaller groups by the teachers in charge of each group, ensuring each group had a senior student in it to do the writing.

In April 2009, the EfS Facilitator held a meeting with the lead EFS teacher and the principal in the school staff room (other support staff regularly moving through the room) to discuss progress with the EfS integration, answer questions and give directions regarding 'where to from here'. During this meeting the staff were given three different 'environmental action planners' (one blank and the other two were examples from other schools) by the EfS Facilitator to discuss (see Appendix 11). After discussing these they filled one out as a group. Also during April the students were divided into three large, mixed age groups again and, in three different classrooms responded, in writing, to eight questions about their environment, provided to the teachers by the EfS Facilitator. I chose one group, again, for no particular reason, to sit with in and observe and make written notes of what I saw. In April the principal provided me with a summary of "Ferndale matters" meeting held after school, attended by all teachers and 20 parents (see Appendix 12).

In May, 2009, the EfS Facilitator held a meeting with the lead EfS teacher. The principal attended the meeting for approximately one third of the total meeting time. The meeting was held in the staff room, again, with other individuals present but not participating in the meeting. The meeting served to give continued direction, from the EfS Facilitator regarding the direction the school should take from where they were at the time in terms of EfS integration and took into account what they had already been involved in.

In July, 2009, I held semi-structured interviews with the three teachers participating in EfS. The interviews were one-on-one and held in their classrooms at the end of the day after students had gone home. There were five interview questions focussed on their understanding of EfS, whole school approaches and EfS in the classroom (see Appendix 6).

In November, 2009, I held small focus-group sessions with six mixed groups of Year 5 and Year 6 students. There were six groups of students, each group consisted of two or three students. The sessions were held in the students' classrooms, with no other students present. We were seated on the class mat (on the floor), in a small circle to discuss the six questions I wanted to ask them about their understanding of the term sustainability, if they thought the environment was important to look after, whose job it was to look after the environment, what they had been doing in class in relation to EfS (see Appendix 9).

In December, 2009 I held a semi-structured interview with the EfS Facilitator in a private meeting room at the school. The interview was comprised of seven questions and required the Facilitator to review her responses to the same questions at the beginning of the year and discuss what her thoughts on the same questions were now, at the end of the schools' first year of EfS integration (see Appendix 8). I also emailed individual written questionnaires (10 questions) to two of the staff members (i.e. in order not to overburden the principal or lead EfS teacher, they were given to the other two classroom teachers at the school) to gain their impressions of their understanding of EfS, teaching and learning approaches and whole school approaches (see Appendix 7).

In September, 2010, I emailed the school principal a written questionnaire, consisting of nine questions, to present to the staff to gather their views on how their thoughts on EfS had changed over the year and what EfS related practices they were involved in (see Appendix 10). The staff elected to respond as a group and emailed me their responses.

4.8 Trustworthiness: Issues of validity and reliability

The quality of research has traditionally been measured in terms of its validity and reliability. The positivist paradigm requires that the following four criteria be used in judging value: internal validity; external validity; reliability and objectivity (Cohen et al., 2011), and deals primarily with numerical data and statistical interpretations under a reductionist, strictly objective paradigm (Leung, 2015). Internal validity is concerned with asking if the experimental treatments make a difference in the specific experiments under scrutiny (Cohen et al., 2011; Merriam, 2009). External validity concerns generalisability, i.e. how far can we generalise from a sample to a population (Cohen et al., 2011; Creswell, 2012; Merriam, 2009). A precondition of external validity is internal validity, as there is little purpose in generalising meaningless data (Creswell, 2012). The concept of reliability is essentially a synonym for dependability, consistency and replicability over time, over research instruments, and over groups of respondents. Reliability is also a precondition for validity (Cohen et al., 2011; Creswell, 2012; Merriam, 2009). Finally, objectivity refers to the extent to which the findings are influenced by the researcher, aiming for as little influence as possible (Cohen et al., 2011).

In contrast, the qualitative approach handles non-numerical information, the interpretive nature of which is inextricably tied in with subjectivity. The human emotions and perspectives of both researchers and participants can produce both undesirable biases which may confound results, and at the same time add extra dimensions to and enrich the data collected (Leung, 2015). The applied nature of most social science research makes it important that the researchers and readers have confidence in the conduct of the investigation and the results of the study (Merriam, 2009). A variety of suggestions have been made for assessing quality in qualitative research, including emphasizing methodology (Dixon-Woods, Shaw, Agarwal, & Smith, 2004), the rigor of interpretation of results (Lincoln, Lynham, & Guba, 2011), and the fulfilment of the dual criteria of ‘transparency’ and ‘systematicity’ (Meyrick, 2006). A summary of alternative means of determining trustworthiness within qualitative research are discussed in the following sections.

4.8.1 Qualitative internal validity: the issue of credibility

Validity in qualitative research refers to the ‘appropriateness’ of the tools, processes and data. In other words, whether the research question is valid for the desired outcome, the choice of methodology is appropriate for answering the research questions, the design is valid for the methodology, the sampling and data analysis is appropriate, and finally whether the results and conclusions are valid for the sample and context. (Creswell, 2013; Leung, 2015; Merriam, 2009). Internal validity can be described as “truth, value, applicability, consistency, neutrality, dependability, and/or credibility of interpretations and conclusions within the underlying setting or group” (Onwuegbuzie & Leech, 2006, p. 234).

In qualitative research, internal validity can be addressed in several ways: by using multiple researchers; participant researchers; peer examination of data; and using mechanical means to record, store and retrieve data (LeCompte & Preissle, 1993). In interpretive research there are a variety of methods with which to establish some internal validity, such as confidence in the data, the authenticity of the data, the soundness of the data, and the credibility, auditability, and confirmability of the data (LeCompte & Preissle, 1993, p. 338).

Triangulation is a strategy that is used to ‘improve’ the internal validity of a qualitative study (Merriam, 2009). It can be defined as the use of two or more methods of data collection used in the study of some aspect of human behaviour, and attempts to explain more fully the richness and complexity of human behaviour (Cohen et al., 2011). Four types of triangulation have been described by Merriam (2009): the use of multiple methods, multiple data, multiple researchers or multiple theories to confirm findings. Merriam (2009) states that the use of approaching data collection from multiple theoretical viewpoints is less common than the other three forms of triangulation. Triangulation of data collection methods involves comparing, for example, what someone tells you in an interview, with what you observe in the field, and what you read in available documents (Merriam, 2009). Triangulation using multiple sources of data means comparing and cross-checking data collected through observations collected at different times or places, or interview data collected from people with different

perspectives or from follow-up interviews with the same people (Merriam, 2009). Researcher triangulation occurs when there are multiple investigators collecting and analysing data (Merriam, 2009). Cohen et al., (2011) also describes ‘time triangulation’ as a type of methodological triangulation which attempts to take into consideration the factors of change and process through cross-sectional and longitudinal designs.

Member checking, also called ‘respondent validation’, is an additional strategy for ensuring internal validity. It involves gaining feedback on your emerging findings by taking your preliminary findings back to the participants involved and asking them if the information accurately represents their opinions/viewpoints (Merriam, 2009). I utilised this form of validation in my study by transcribing the adult interview responses and then allowing them to read them to check that I had understood their responses correctly.

Peer reviewing involves another, suitably informed, member of the academic community reviewing the data in order to see if similar understandings to the original researcher are reached (Cohen et al., 2011; Merriam, 2009). Some peer reviewing by the chief supervisor of this study occurred during the data analysis phase of this study in order to establish if my interpretation of the identified themes was appropriate.

4.8.2 Qualitative external validity: the issue of transferability

The concept of external validity refers to the degree to which results can be generalised to the wider population, cases, settings, times or situations (Cohen et al., 2011; Leung 2015). In qualitative research human behaviour is complex, irreducible, socially situated and unique, thus the issue of generalisation is potentially problematic (Cohen et al., 2011; Leung 2015; Merriam, 2009). Cronbach (1975) suggested that in qualitative research the concept of ‘working hypotheses’ is more useful than generalisability in a statistical sense. ‘Working hypotheses’ reflect situation specific conditions in a particular context (Cronbach, 1975, as cited in Merriam 2009). Merriam (2009) suggests that a useful understanding of qualitative generalisability is to think in terms of the reader or

user of the study. Reader or user generalisability involves leaving the extent to which a study's findings apply to other situations up to the people in those situations. The people who read the study can decide whether the particular findings apply to their particular situation (Merriam, 2009).

4.8.3 Qualitative reliability: the issue of dependability

Reliability is essentially a synonym for dependability, consistency, and replicability over time, over research instruments, and over groups of respondents (Cohen et al., 2011; Creswell, 2013; Leung, 2015; Merriam, 2009). For research to be reliable it needs to demonstrate that if it were to be carried out with another, similar group of respondents in a similar context, then similar results would be found (Cohen et al., 2011; Merriam, 2009). In qualitative research, such a definition of reliability is challenging and a margin of variability for results may be tolerated if the methodology and epistemology consistently provide data that is ontologically similar but may differ in richness of information (Leung, 2015). Lincoln and Guba (1985) suggest replacing the term 'reliability', with terms such as 'credibility', 'neutrality', 'confirmability', 'consistency', 'trustworthiness', 'applicability', and, in particular, the idea of 'dependability'. In qualitative research, an important question is whether the results are consistent with the data collected, i.e. that to the reader, the results make sense, and are consistent and dependable (Merriam, 2009). In this study, special consideration was taken, for example with regards the specificity of the questions in interviews and questionnaires such that they yielded relevant responses.

4.8.4 Qualitative objectivity: the issue of confirmability

The notion of confirmability can be considered to be a more appropriate way of describing the objectivity of a naturalistic study (Lincoln and Guba, 1985). Confirmability concerns the influence of the researcher on the data. Confirmability can be enhanced by establishing a clear audit trail in which the reader can judge for themselves if there is any influence on the part of the researcher (Merriam, 2009). In this study I took the stance of observer-as-participant, endeavouring to remain as unobtrusive as possible when making

observations. I also endeavoured to note as much detail as possible during observations in order to reduce the possibility of being unduly selective in the recording of information.

4.8.5 Trustworthiness concerns addressed in this study

Trustworthiness in observations can be supported by using a rich, thick description (Creswell, 2014). In this study, I chose to use unstructured observations whereby I sat slightly back from the meeting table in staff meetings (held in an open meeting room to one side of the staffroom) and classroom sessions with the EfS Facilitator. I endeavoured to remain as unobtrusive as possible during the meetings and classroom observations. I aimed to create a 'rich, thick description' during these observations, and wrote a detailed description for each observation, including notes of what was happening at the time, what was said and by whom (either verbatim quotes from staff or students, or what I considered the essence of what was said). Information was recorded continuously during the meetings and classroom sessions. Unstructured observations allowed me to observe and record the participants in a naturalistic setting which would provide for a more holistic understanding of what was taking place in the setting.

The use of interviews as a data collection method can present several concerns with respect to the trustworthiness, or validity of the inquiry. Interviewer bias is seen as one potential source of concern regarding validity. (Cohen et al., 2011). Additionally, there are apparent contradictions regarding the possible effects of the format and structure of the interview questions on the validity of the responses. Silverman (1993) and Oppenheim (1992) suggest that one can control for reliability by using a highly structured interview format, with precisely the same format, sequence of words, and questions for each participant. However, on the other hand, Silverman (1993) also argues for the importance of open-ended interviews as this allows respondents to demonstrate their unique way of looking at the world, i.e. their definition of the situation.

The use of leading questions as a source of potential bias also needs to be addressed when arranging an interview schedule. The imprudent use of leading

questions, or a lack of acknowledgement of the awareness of their presence in interview transcripts may result in false or misleading assumptions being drawn from interviewees (Cohen, Manion and Morrison, 2011).

One-on-one interviews allowed me to collect detailed information from individuals in a private setting (a closed meeting room in the school administration block), without any external influence or interference from other individuals.

In order to reduce potential threats to the validity and reliability of the student focus group responses, I held focus groups in the students' classroom, when the other students were not present, as I considered this to be a familiar, and thus less threatening environment. The students and I sat on the classroom 'mat' in a small circle and I talked about the questions I wanted to ask using language which I knew to be familiar to them as I had spent some time observing their class(es) prior to the focus group sessions. This familiarity with the students I hoped would also allow the students to feel more relaxed in my presence, and reduce any perceived 'power' imbalance that I may have brought to the interview (Cohen et al., 2011).

Documents can present difficulties by being hard to locate and obtain, or incomplete, inauthentic, inaccurate, or challenging to decipher if hand-written (Creswell, 2012). For my research I collected copies of written responses from students that resulted from various EfS related tasks that they engaged in. This type of data allows the researcher to obtain the thoughts of the students in their own words, and is an unobtrusive form of data collection. Data of this type may be limiting if the participants are not all equally able to express themselves in written form, and the responses of the participants may be incomplete or inaccurate (Creswell, 2009). Taking this into consideration, written responses from students may be limited by their written language skills and may vary in depth of thought depending on the classroom working conditions (i.e. the behaviour of the class). The students' written responses provided only a small proportion of my data, and were decipherable and coherent for the most part, with only rare instances requiring discarding for being unable to be understood or read.

4.9 Ethical considerations

Qualitative research involves collecting data from people, about people (Creswell, 2009). Researchers need to protect their research participants from harm, develop a sense of trust with them, promote the integrity of the research and guard against misconduct and impropriety (Creswell, 2009). Ethical concerns in educational research occur in four main areas: access to participants, informed consent, the right to privacy, and protection from harm (Cohen et al., 2011; Creswell, 2009).

Access to participants includes both access to the location of the individuals, and their voluntary, individual recruitment. Informed consent implies that participants are free to choose whether or not to participate in the study after having been fully informed of the process of the research that they have been invited to participate in (Bell, 2005; Creswell, 2009, Cohen et al., 2011). The right to privacy is associated with the confidentiality of the data gathered on the participant and protecting the identity of the participant. The idea of protection from harm relates to care being taken to ensure that the participants in the study are not adversely affected in any way.

Permission for this study was gained from the Human Research Ethics committee in the School of Science and Technology at the University of Waikato (see Appendix 13). Access to participants was gained by permission from the principal of the school. Participants were given the right to decline participation or withdraw from the study at any time. Potential participants were given full information about their role in the study and were asked to sign an informed consent form after agreeing to participate. The parents/caregivers of the children involved in the study were given the opportunity to allow or refuse the children's participation in the study. The data collection procedure required the adult participants to allow time during their working day for interviews, and to choose a time of their own choice for the written questionnaires. Child participants were given permission by their teachers to be involved in small focus groups during class time. At the time of the data collection I assured the children involved in the study that they were not required to respond if they did not wish to. Although I did not formally include the assent of the child in my ethics forms (the children

involved in the study were quite young, 8-10 years and to involve them in an extended discussion as to the purpose of the study might have been somewhat challenging at the time), I could see that having their assent was still of importance, and at no time did I 'push' a student to respond if they appeared reluctant.

Participants in this research were assured of anonymity in the study and confidentiality of responses. Steps taken to ensure this involved not revealing the participants' names to anyone, the use of a pseudonym for individuals (and a pseudonym for the school), and the use of these pseudonyms on all written data pertaining to the individuals, including written excerpts in the thesis. All data gathered from participants was kept secure, and participants had the right to access any data gathered from them at any time during the study.

All statements made by participants during the study were treated with confidentiality. No responses, from either adults or children, were shared with anyone else other than study supervisors. I considered it useful and important to assure students that they were free to respond how they wished, and that their responses were not being 'assessed' for being 'right' or 'wrong', and that the things they said would not be shared with their teachers or any other adult. I explained this to each group of students because I wanted to ensure that they did not feel they were being 'tested', and I was interested to hear as genuine responses as possible.

4.10 Chapter summary

In order to answer the research questions presented in this study an interpretive methodology was chosen. This methodology would allow examination of themes to be interpreted from the data in relation to the planning, implementation and outcomes phases of the school's first year of integration of a whole school approach to EfS. Specifically, it provided for examination of the participants' meanings and interpretations of their experiences throughout these three phases.

A longitudinal case study was chosen as the research involved visiting one study school at intervals over a period of a year, and data was only collected from that particular school. Data collection was primarily by one-on-one interviews, small focus group interviews, classroom and meeting observation and, to a lesser degree, document analysis. The data was analysed with a content analysis approach, whereby codes were written prior to analysis, and then the data was manually coded and sections of data were grouped by matching themes. On occasions, new 'codes' were used where deemed appropriate. The interview structure and codes were informed by the framework of developing a whole school approach to EfS (Eames et al., 2013).

The trustworthiness of the study was enhanced by the use of member checking of interview and questionnaire transcripts, peer reviewing, setting up interview situations such that the participants were unlikely to be distracted or influenced by others, and such that any issues of 'power', on the part of the interviewer, were reduced (particularly with respect to interviewing children, where power issues may have greater influence). When conducting meeting or classroom observations, I aimed to create 'rich, thick descriptions', as well as providing a detailed outline of the data collection episodes during the year. Care was taken to follow ethical procedures at all times.

The next chapters present the results of the content analysis of the data and are arranged in three sections: planning, implementation and outcomes of a whole school approach to EfS.

Chapter 5

Planning a whole school approach to education for sustainability

5.1 Chapter outline

The data presented in Chapters 5 to 7 describes the planning, implementation and subsequent outcomes of the development of a whole school approach to education for sustainability (EfS) in a rural primary school during its first year. The data presented in Chapter 5 is drawn from observations of meetings with the teaching staff (August, 2008, November 2009, see Table 4.1) and the EfS Facilitator, and individual formal interviews with the principal, lead EfS teacher (March, 2009, see Table 4.1) and EfS Facilitator (February, 2009, see Table 4.1) during the planning stage of the development of the whole school approach to EfS. Each data chapter is subdivided into four key areas of school life that may have an effect on student learning in EfS: (1) People (and Participation); (2) Programmes; (3) Practices; and (4) Place (Enviroschools, 2014). While content analysis was used in the research, the data was presented as a narrative of events from each of these four key areas (Cohen et al., 2011).

5.2 People (and Participation)

One of the four key areas of a whole school approach that can have an effect on sustainability and student learning is the people and their participation within the EfS programmes (Enviroschools, 2014). A school may not be able to have every person in the school and its community involved, but it has been suggested that the greater the level of participation the easier it is to create a sustainable school (Hamilton City Council, 2005).

The people who participated directly in this study during the planning stage included Ally (the principal), Brianna (the lead EfS and Year 2 and Year 3

teacher), Jessica (a Year 3 and 4 teacher), and Sarah (a Year 5 and 6 teacher). Beth, the EfS Facilitator also participated in the study at the planning stage.

Towards the end of 2008, prior to starting the whole school approach to education for sustainability, the school had a change of senior staff when the principal left the school and one of the junior school teachers, Brianna, took on the role of acting principal until the end of the year. Brianna appeared to have a strong personal interest in EfS and the Enviroschools concept, and made contact with an EfS facilitator (Beth) about getting the whole school involved in EfS. Based on informal discussions between Beth, Brianna and myself, it seemed that the other three teachers within the school were also keen to become involved in EfS. However, as I had not met any of the other teachers at that stage (end of 2008) I was unsure as to their level of interest and prior knowledge about EfS. This personal interest and enthusiasm for EfS shown by the teaching staff, and by Brianna in particular, was a key 'enabler' in the planning stage of the whole school approach.

The school had not participated in any EfS before the year this study was undertaken. Some staff had undertaken limited professional development in EfS, as the lead EfS teacher explained:

Jessica and I went to an Enviroschool [course] last year (2008) that looked at the sustainable practices in place, so the two of us went on that course, the others haven't been to or seen any model schools. The only sort of development that we've had together is with Beth [EfS Facilitator].

(Formal interview, Brianna, March 2009)

The overarching themes that were identified in terms of the planning of a whole school approach to EfS were: how the teachers understood the concepts of sustainability and a whole school approach to EfS; leadership and collaboration in the development of a whole school approach to EfS; cultural aspects in the school; action being taken within the school; and relationships between the school and its community.

5.2.1 Teacher understanding of the concepts of sustainability and a whole school approach to education for sustainability

One of the themes that emerged from the interviews held with Ally and Brianna in March 2009, in terms of planning consideration, was the teachers' understanding the concepts of sustainability and a whole school approach to EfS. When asked what they understood by the term 'sustainability', Brianna said that it meant "to sustain things.... if we're going to sustain things, they're going to carry through...and not fall over" (Formal interview, Brianna, March 2009). Ally gave a more lengthy description:

I think it's something..... that manages....that keeps going with minimal additional resources.....it's really a system in place that can continue with changes of personal direction....I do think it becomes habitual..... an ingrained thing.....just something somebody does.....almost automatically.....but it can't be always required to be additionally resourced.....might need people resources but not financial resources all the time.....long-term rather than some short term fix.

(Formal interview, Ally, March, 2009)

Both Ally and Brianna appeared to perceive sustainability as a relatively simple concept that was based primarily on maintaining something over time. There was also an indication that Ally viewed sustainability as related to systems and resources. The additional two teachers participating in the study were not interviewed at this time in order to reduce any possibilities of being perceived to be 'excessively' drawing data from staff.

In terms of the understanding of a whole school approach to EfS, Ally considered the phrase 'whole school approach to EfS' to include "all the key stakeholders, not only the children from the five year olds onwards, but the staff, the parents, the whole community behind it", otherwise she didn't feel it would be sustaining (Formal interview, Ally, March 2009). Brianna had a similar understanding of the term 'whole school approach to EfS' to Ally, i.e. that everyone was 'on board' and had a role to play (Formal interview, Brianna, March 2009). Thus it appeared

that the ‘people’ aspect formed the basis of the understanding of a whole school approach to EfS at this stage for both staff members.

Both Ally and Brianna felt that a whole school approach to EfS was desirable at Ferndale School. Brianna saw her role in the planning of a whole school approach to EfS as someone who was there to support the students’ learning about how they could sustain the environment at their school (Formal interview, Brianna, March 2009). Ally, as the principal, felt her role was to support the development of the whole school approach with resources, time, money and enthusiastic leadership (Formal interview, Ally, March 2009). These seem to be narrow viewpoints, perhaps not unexpected at this point in becoming an enviroschool, which do not incorporate any ideas from the New Zealand curriculum, such as students having the opportunity to become lifelong learners, informed decision makers or become sustainable citizens (MoE, 2007). These somewhat simplistic and limited views of EfS, as apparently held by the staff, appeared to be important inhibitors in the planning stage of the development of the whole school approach to EfS.

Both Ally and Brianna were asked where they felt the school was, at this early planning stage, in terms of sustainability. Brianna said that she thought they were very much at the beginning, and that they (she and the students) were just talking about what the environment was and what sustainability meant to them. She mentioned that they had been talking about the idea of the students being ‘guardians’ of the school and how they needed to sustain it for future generations (Formal interview, Brianna, March 2009). Ally thought that the school environment was basically sustaining already as it was a “natural environment and not too fussy” (e.g. there was a patch of native bush at the back of the school grounds that didn’t require maintenance), and cited the community support of the small school as important in maintaining a culture of “helping and keeping things going”. However, she did not think that they had a sustainable system in place for dealing with issues like waste (Formal interview, Ally, March 2009). Both teachers appeared to interpret the school’s current position in terms of sustainability from different perspectives: Brianna responded in terms of ‘teaching’ EfS by developing students’ awareness and sensitivity, and attitudes and values with respect to the environment and related issues, which corresponds

to one of the five aims of environmental education in *The Guidelines for Environmental Education in New Zealand Schools* (MoE, 1999). She also appeared to exhibit awareness of the need for intergenerational equity. Ally responded more in terms of the physical environment, or ‘place’, and the sustainability practices within the school.

In terms of prior staff professional development and training in EfS, it appeared that whilst Ally had previously been involved with a school that had “gone down that path” before, under the ‘old EE/EfS umbrella’, she considered there to be “no real expertise” in EfS inherent in any of the teachers at the school (Formal interview, Ally, March 2009). Brianna explained that she and another teacher had visited another enviroschool in the year prior to Ferndale school engaging in EfS themselves in order to see sustainable practices in place. These two teachers had also both participated in a ‘Kick Start’ professional development course which Brianna thought had really motivated them to undertake EfS in their own school. Thus it appeared that the teachers had very limited formal experiences in EfS training prior to engaging in a whole school approach to EfS, and that this could be an inhibitor in the school’s planning of its whole school approach to EfS.

In terms of their vision for the school with regard to EfS, both Ally and Brianna wanted the students to develop a sense of ownership of the school environment which they hoped would lead to greater care of it by the students (e.g. less litter on the ground) (Formal interviews, Ally & Brianna, March 2009). In addition, Ally said that “we are trying to develop a ‘keepers of the school’ philosophy, where we all realise that we don’t own the place but it’s really important that we keep it going for others.... we’ve got to have some long term direction” (Formal interview, Ally, March 2009). This suggested that Ally wanted the students to develop a sense of intergenerational equity. It also seemed that for both Ally and Brianna, the students’ attitudes and values, and awareness and sensitivity to the environment, were the two aims of EfS (MoE, 1999) that were of greatest importance at this stage. One other aim, that of knowledge and understanding of EfS (in this case, ‘the environment’) was in its very early stages at this time.

5.2.2 Leadership and collaboration in the development of a whole school approach to EfS

Leadership and collaboration were themes that also emerged from the interviews with Ally and Brianna during the planning stage of the development of the whole school approach. Ally saw her role as principal (i.e. school leader) to be fundamental in keeping up the motivation within the school. She also indicated that because of the school's small size (i.e. one principal and four classroom teachers) that they all had a role in forming the direction of the school (Formal interview, Ally, March 2009). Brianna also commented on the small size of the school and how this meant that all the teachers and the principal had similar levels of involvement in decision-making, i.e. there was no 'senior team' of teachers that met with the principal, assistant principal or deputy principal, and who would then report back to the other staff members, as was often the case with larger schools (Formal interview, Brianna, March 2009). The involvement of all the staff in decision-making processes within the school was in partial accordance with the key area of 'People and Participation', as described by the Enviroschools philosophy, which notes that "decisions and actions are made with the involvement of students, staff and other members of the community" (Enviroschools, 2014). The small size of the school, and potential for equal decision-making opportunities by the staff could be viewed as an enabler in the process of planning a whole school approach to EfS.

Both Ally and Brianna felt that there was good collaboration across the school between the staff because of the school's small size and that this would help their EfS endeavours (Formal interviews, Ally & Brianna, March 2009). Ally thought that there was quite a lot of support from the parents of the school and wider community also, and that their challenge was to harness that support and keep the momentum going (Formal interview, Ally, March 2009). These comments from the principal and staff appeared to show that they recognised the importance of people in the community and their participation in developing a whole school approach to EfS (Enviroschools, 2014).

5.2.2.1 The EfS Facilitator

The school had an external EfS Facilitator, Beth, who had periodic meetings with the staff and ‘teaching sessions’ with the students during their first year of the development of the whole school approach to EfS. In a formal interview with Beth during the planning stage of the development of the whole school approach (i.e. February 2009), she mentioned that she wanted to get the school to a stage where EfS was ‘embedded’. When asked what she would like to see happen at the school in terms of sustainability, she responded that she wanted the thought processes of the people at the school “automatically tuned into sustainability (staff, students, community, BOT)”; that “visibly the whole place reflects the ethos of sustainability”; that they (the school) were engaging in EfS practices, “doing the recycling, composting etc”, and that it was “written down that EfS is a part of [Ferndale] school culture (policies etc...)”. Beth felt that she saw “a united desire to create a sustainable environment and see learning outcomes” at the school (Formal interview, Beth, February 2009). This united interest in EfS from the staff could be seen as an enabler in the planning of the whole school approach to EfS.

When asked what sustainability issues she felt the school needed to work on at this planning stage, and what potential ‘barriers’ (i.e. inhibitors) did she perceive, Beth thought that they (the school) “need to get a little bit of cohesion, there are many ideas but need to take one step at a time ... (the) staff need to give more ownership to the students, i.e. from the identifying stage, staff are still seeing the physical environment as number one (ie power, water)”. Beth felt that “they (the school) compare favourably with other schools because being a small school is a plus as they can work as a cohesive unit and are mutually supportive”, and that “having an enthusiastic participating principal is also a plus”. However, she still wanted to see more links to the curriculum during the planning stage (Formal interview, Beth, February 2009). The teachers’ limited views of sustainability could be seen as an inhibitor to the development of curriculum links for the whole school approach to EfS.

Brianna and Ally considered the role of their EfS Facilitator to be that of a ‘guide’ to help them on their EfS journey, whilst providing support with resources and knowledge. They also felt that the Facilitator would help keep the ‘momentum’ going with the project (Formal interviews, Ally & Brianna, March 2009). It appeared that the EfS Facilitator was considered to have an important support role for the school in its development of EfS. This support role of the EfS Facilitator could be considered an enabler during the planning stage of the development of the whole school approach.

5.2.3 Cultural aspects in the school

It appeared that the cultural diversity of the school had, over the past few years, become more diverse than it had previously been, and neither Ally nor Brianna thought that as a school they were reflecting the current cultural diversity of their students and their families (Formal interviews, Ally, Brianna, March 2009). This could inhibit the development of a whole school approach to EfS that requires consideration of cultural diversity in planning.

In terms of acknowledging New Zealand’s bicultural foundations, Brianna said that she was enjoying the ‘Māori aspects’ of the Enviroschools programme, and that a lot of the ‘roots and grounding’ of the programme had a Māori background, and that it was bringing them back to the guardianship concept that they wanted to foster at the school:

I think that’s great for us as a school because it’s making us go right back to... NZ’s past and the importance of the Māori people. . .and then from there we can start looking at the different cultures.

(Formal interview, Brianna, March 2009)

It appeared that Brianna was keen to establish attitudes and values within the student population that reflected care and concern for the environment, and saw Māori cultural aspects as being a helpful context for this. This could enable the planning of the development of the whole school approach.

5.2.4 Action being taken within the school with respect to a whole school approach to EfS

Ally, the principal, felt that action was being taken in the school at the systems level during the planning stage by reviewing school processes and systems such that they could be sustained with future changes of staff. The systems review was being undertaken in consultation with the community and the school staff. This could be an enabler during the planning phase of the whole school approach. Ally said that “they (the school community) really want to be quite controlling and keep us as it has been for a very long time..... most still want to retain the small, rural, country flavour that [Ferndale] has” (Formal interview, Ally, March 2009). She also mentioned that the school had to ensure that their new systems embraced the direction of the new New Zealand curriculum (MoE, 2007) where she felt everything was child-centred (Formal interview, Ally, March 2009). Child-centred learning approaches are advocated by the Enviroschools Programme within the ‘Programmes’ key area of schooling life (Enviroschools, 2014) and can act as an enabler during the planning of a whole school approach to EfS.

Brianna, the lead EfS teacher, explained that the school had recently had problems with an *E.coli* bacterial contamination in the students’ water fountains and that ‘action’ had been taken with regard to getting a ‘sustainable’ water fountain. The state of the drinking water supply at the school was considered to be an environmental issue by the staff. In the classroom, they were working on building the students’ EfS knowledge, i.e. asking the students ‘what is an environment?’ and ‘what is sustainability?’ Then they were going to look at the ‘good things’ and ‘bad things’ of their own school environment (Formal interview, Brianna, March 2009). At this stage, Brianna appeared to understand ‘action’ in terms of the physical environment and also from a teaching ‘action’ perspective, i.e. that the teachers were taking ‘action’ by teaching about EfS.

5.2.5 Relationships between the school and community

With respect to relationships between the school and the community and the effect on student learning, Ally responded:

That would be very strong within some groups [of parents], who probably feel that they would like to have a huge role in determining the learning. . .and then we have another group of parents that don't appear to take much interest in the learning. . .so we've got quite a diverse continuum really of extremely interested and then apparently not interested parents. . . not a lot in the middle really.

(Formal interview, Ally, March 2009)

Ally also went on to say a number of local family businesses gave quite a lot of financial support to the school, but that they had very few local “experts” come in and work with the students (Formal interview, Ally, March 2009). It seemed that in Ally's opinion there were extremely varying levels of involvement and participation from school parents and caregivers, and good support in terms of financial involvement from the local businesses. These varying levels of involvement could act as both enablers and inhibitors during the planning of a whole school approach to EfS.

Brianna said that the school had a really close community, with parents that came in and helped a lot. She also mentioned the school's anniversary that they celebrated in the previous year, where much of the community came forward and supported the school with donations of money, plants etc. . . (Formal interview, Brianna, March 2009). Brianna seemed to feel that there was a very strong sense of belonging and ownership from the parental aspect of the community, in alignment with the ‘people’ key area of school life (Enviroschools, 2014). This could help to enable the planning of the whole school approach to EfS.

In terms of involving the whole school community with decision-making at the school, Ally felt that it was very difficult to involve some cultural groups, i.e. the Māori and Pasifika families, and those who came in by bus from the nearest town, but very easy to get involvement from what she described as ‘white, high decile-type families’ (Formal interview, Ally, March 2009). As mentioned above, it appeared that from Ally's perspective that there were extremely variable levels of involvement and participation with the parental community when it came to decision-making at the school. Again, these varying levels of involvement could

act as both enablers and inhibitors during the planning of a whole school approach to EfS.

Brianna talked about a teacher, parent and Board of Trustees group meeting that they had recently held which differed from their usual one-to-one ‘parent-teacher interview’:

Last week we had parent/teacher interviews and rather than sitting down with each teacher, we actually had all the teachers together and all the parents together and then we split up into two groups and we looked at directions for the school, where we wanted to go and we talked about things like uniforms, behaviour management, we talked about Enviroschools and what could you do to help us at our school, we talked about, um, health issues – what do you see as an area that might need addressing?

(Formal interview, Brianna, March 2009)

Brianna felt that they had a good response from families at the meeting and that it was very successful, i.e. a potential ‘enabler’. There was no comment as to the ‘type’ of parents/caregivers that were present at the meeting. Brianna’s perceptions about the level of participation from the parental community in school decision-making appeared to be slightly different to Ally’s, and may reflect the situation that Ally was new to the school.

5.2.6 ‘People (and Participation)’ Summary

A number of themes regarding the ‘People’ area of school life emerged from the interviews held with Ally, Brianna and Beth during the planning stage of the school’s development of a whole school approach to EfS. Firstly, it appeared that for the school leaders, sustainability was perceived as a relatively simple concept that was based primarily on maintaining something over time. There were also indications that sustainability was seen as related to systems and resources. Secondly, the ‘human’ aspect seemed to form the basis of the understanding of a whole school approach to EfS at this stage for both staff members. They viewed their roles in EfS from the perspective of their position within the school, i.e. the lead EfS teacher saw herself as providing support for the students’ learning about

how they could sustain the environment at their school, while the principal saw her role as supporting the development of the whole school approach with resources, time, money and leadership. Thirdly, Ferndale School's position in terms of EfS was considered to be in the process of developing students' awareness and sensitivity and attitudes and values with respect to the environment and related issues. There appeared to be an awareness of the need for intergenerational equity and acknowledgement of the physical environment, or 'place', and the sustainability practices within the school. The somewhat limited understanding of EfS could act as an inhibitor to the planning of their whole school approach to EfS.

Additionally, the small size of the school was considered helpful, i.e. an 'enabler' in allowing greater collaboration between staff and allowed all the staff to participate in leadership decisions during the planning stage of the development of the whole school approach. There appeared to be good participation from the school community in general school life.

At this early stage in the development of a whole school approach to EfS, the facilitator noted that embedding EfS within the 'People, Programmes, Practices and Place' aspects of the school was important. She also considered it important that the staff worked together to create cohesion, that the students were given more ownership, and that the staff expanded their understanding of EfS beyond that of the physical environment only.

Another theme that was drawn related to multi- and bi-culturalism. The multi- and bi-cultural aspects of the school's community were not thought to be particularly well addressed, i.e. possible inhibitors during the planning of the whole school approach, however, the Māori cultural concepts included in the Enviroschools programme (Enviroschools, 2014) were considered to be a helpful context for developing students' attitudes of care and concern for the environment, i.e. possible 'enablers' to the planning of the EfS programmes.

Finally, there appeared to be varying perspectives on the levels of community support and involvement, from very little involvement from some groups to

considerable parental involvement and support in school activities. Higher levels of parental and community involvement could potentially act as enablers during the planning phase, whereas lower levels of participation could potentially act as inhibitors.

5.3 Programmes

The staff started having planning meetings with the EfS facilitator towards the end of the school year (2008) prior to starting to incorporate education for sustainability into the school systems the following year (2009). During the first meeting (August 2008) that I observed with the EfS facilitator and all the staff present, I felt that the level of interest in EfS was high in both Brianna and the new principal (Ally) for 2009 who also attended the meeting, which could act as an enabler in the planning process. However, I felt the level of interest was lower in the three other teachers, which could serve as an inhibitor during the planning process (Meeting observation, August 2008). The staff identified a number of environmental issues that the school could start their EfS work with, e.g. waste and recycling, the bush at the back of the school (currently out of bounds to students) and energy usage (lights). It was noted by the teachers that the school had no caretaker and that this impacted upon the physical school environment (i.e. repairs to school facilities and grounds were slow and/or non-existent).

5.3.1 Inquiry learning / Planning an integrated inquiry

In November 2008 (the end of the year prior to formally beginning their EfS work), the EfS facilitator, Beth, held a meeting with Brianna (the lead EfS teacher) and Ally (the new principal for 2009), which I observed. The facilitator asked the two staff members what they wanted the focus of sustainability to be: global or local (i.e. the school). Brianna thought that a global focus would be better as students might apply the knowledge to their own lives (Meeting observation, 28/11/08).

The EfS facilitator led a discussion around inquiry learning and how the teachers might find it helpful with integrating EfS into the school. Ally mentioned that

inquiry learning was starting to be used within the school but that the staff were still trying to find an overarching teaching/learning approach in light of the new curriculum (MoE, 2007) and change of principal. During this meeting the EfS facilitator introduced two documents to Brianna and Ally from her collection of resources: an “*Inquiry, Co-operative and Experiential Learning Framework*” (Appendix 1); and “*Education for sustainability: a whole school focus*” (Appendix 2). The EfS facilitator talked about how she saw the New Zealand curriculum as being inherently about sustainability (Meeting observation, 28/11/08). The EfS facilitator asked Brianna and Ally: “What do you want your students to understand, to do and to be”, as she felt that this would help their planning. The teachers made no specific response to this but agreed that they would have to include this in their planning for the year. The EfS facilitator discussed the “*Inquiry, Co-operative and Experiential Learning Framework*” (Appendix 1) with Brianna and explained how sustainability could be seen “as an umbrella that everything hangs from, it pins curriculum areas together and can be inherent in all curriculum areas”. The EfS facilitator talked about the values and principles that are linked to this framework how “inquiry leads to action” (action competence) and that this is an integral part of the framework.

The EfS facilitator introduced Brianna and Ally to a planning support document called *Planning an integrated inquiry: guide and proforma* (Appendix 3) from her collection of resources and support documents. She described how this was a teaching planning format that they could use to help them to integrate a whole school approach to education for sustainability. There was an emphasis in the discussion around these documents (Appendices 1, 2 & 3) on “what is the ‘big understanding’ that we want from this?” asked by the EfS facilitator of Brianna and Ally in terms of teaching and learning (Meeting observation, 28/11/08). Brianna and Ally appeared favourable towards the guide (Appendix 3), however, Ally expressed concerns about using it with very young children and about how to put into practice what she perceived to be ‘true’ inquiry learning with them. Although Ally did not specify what she perceived true inquiry learning to be during this meeting, in an interview held with her early in 2009 she described an inquiry-type approach as being “where the children come up with suggestions, maybe they’re prompted by some open questions that stimulate thinking. They

need to work in groups, it needs to be collaborative. They need to be using a kind of a problem-solving type approach” (Formal interview, 03 March, 2009). Brianna and Ally talked about the possibility of investing time in preparing younger children with ‘the basics’ for when they were older and could engage in what they perceived as ‘true’ inquiry learning (Meeting observation, 28/11/08).

At this point the EfS facilitator’s planning documents, “*An EFS inquiry learning framework*”, “*Education for sustainability: a whole school focus*”, and “*Planning an integrated inquiry: guide and proforma*” (Appendices 1, 2, & 3), appeared to provide useful theoretical frameworks for the teachers of the school to use to integrate sustainability into their curriculum. The planning documents provided by the EfS Facilitator could also be considered as enabling factor in the planning of the whole school approach. However, it seemed to me that the staff might struggle with the practical side of integrating EfS into the curriculum because it was apparent that they did not have a well-developed understanding of the key concepts underlying EfS, in particular the interdependence between biophysical, social, economic and political systems (MoE 1999). Beth, the EfS facilitator, in February 2009, said that “the staff need to get a little bit of cohesion, there are many ideas but need to take one step at a time. The staff need to give more ownership to the students, i.e. from the identifying stage. The staff are still seeing the physical environment as number one (i.e. power, water)” (Formal interview, Beth, 19/02/09). This apparent main focus on the physical environment was apparent to me (right from the very beginning of my observations of their meetings) as a potential inhibitor to the planning and implementation of a whole school approach to EfS.

5.3.2 Planning the curriculum for Term One

5.3.2.1 Developing student knowledge and understanding

It was suggested by Ally (the principal) that they start looking at mapping out the curriculum for Term One, 2009 during a planning meeting with the staff and EfS facilitator during November, 2008. Ally suggested that for the first part of Term One they could start with developing student knowledge and understanding by

learning about global concepts, e.g. “What is an environment?”, and then lead students towards learning about their school environment, encouraging the students to discuss questions such as: “What effect is the school having on the local environment?”; and, “What can we do at *our* school?” (Meeting observation, 28/11/08). The EfS Facilitator supported the Term One planning discussion by sharing some EfS resources about fieldtrips that were possible for the school. The EfS Facilitator then showed Ally and Brianna (the lead EfS teacher) a table in which staff could ‘tick the boxes’ to ensure they were covering the curriculum areas (personal observation during meeting, 28/11/08).

Ally and Brianna expressed their concerns with the EfS Facilitator about what they felt to be their students’ insufficient fundamental content knowledge of biological systems such as plant life cycles, and that this would have to be taught to the students before incorporating EfS into the curriculum and school systems. The staff recognised that the students needed some level of basic content knowledge prior to engaging in EfS but they were uncertain about the level of knowledge required. This lack of basic knowledge could have an inhibiting effect during the planning of the whole school approach.

Ally, the principal, then talked about the students and teachers making possible visits to the botanical gardens and other enviroschools in order to give them experiences ‘in’ the environment that may support their EfS learning. In response to this, the EfS facilitator explained to the staff about how the main resource was their school and asked them to think about what they have already that they could utilise in their EfS learning. This appeared to prompt Ally to discuss ideas that she felt could potentially be activities for the students to help them learn about EfS, i.e. compost bins, and care of school chickens (Meeting observations, 28/11/08). At this early stage of the EfS integration into the school it remained to be seen whether these experiences would be formative experiences ‘in’ the environment or provide opportunities for developing emerging attitudes and skills ‘for’ the environment (i.e. enabling EfS), and also to what level the EfS experiences would be topic-based rather than issues-based (Barker & Rogers, 2004). There was a discussion about how these ideas could be included in general planning, in addition to planning for term one.

There was discussion between Ally and the EfS facilitator during the planning stage regarding the possibility of exploring different themes for each term, e.g. types of gardens and wild areas and what plants suited which environment. Ally wanted the aim for the first term to be “what do we understand by the term environment?” Ally and the EfS facilitator talked about having a visitor come in and talk to the students about the concept of ‘environment’. The EfS facilitator brought up the themes concept for each term again and suggested some activities that they could do to tune the students in to the concept of environment (Meeting observation, 28/11/08). There was general discussion between the staff and the EfS Facilitator around making plans for the start of Term One, and different types of ‘tuning-in’ activities the staff could use to start ‘sowing EfS seeds’, with their students. The staff were interested in finding out what the students already knew. Ally mentioned that they could use the question “where is our place in the world?” to prompt student activities and discussion (Meeting observation, 28/11/08). At this stage the planning seemed to be primarily topic-based rather than issues-based (Barker & Rogers, 2004).

To this point there seemed to be a lot of focus on the teachers wanting to build student content knowledge, or education ‘about’ the environment (MoE, 1999) and trying to decide what the EfS related theme(s) of each term should be. While developing the students’ understanding of ecology and biological systems can help students establish their own environmental values and attitudes (i.e. an enabler), it was apparent that there was a lack of inclusion of developing student knowledge and understanding around additional aspects of EfS, such as cultural awareness, economic activities, political decisions and health and safety issues (MoE, 1999), which could inhibit their development of understanding of EfS. It was unclear at this stage whether this focus on ecology on the part of the teachers was a result of them perceiving ecology to be the starting point of EfS, after which other aspects of EfS would be introduced to the students, or whether the teachers simply were not aware of the multidisciplinary aspect of EfS.

5.3.2.2 Developing attitudes and values: ‘Caring for our school environment’

During the planning phase, the EfS Facilitator, Brianna (the lead EfS teacher) and Ally (the principal) talked about including a global EfS focus in Term One that the senior students (aged 9 and 10 years) could think about and discuss (Personal observation during meeting, 28/11/08). The EfS Facilitator asked Brianna and Ally what they thought they wanted their school’s ‘big’ focus to be? Ally suggested the values-oriented statement, “everyone has a part to play”, and also, “what have we got now and how can we protect it”? This is in accordance with one of the five aims of EfS in New Zealand schools which is for students to “develop attitudes and values that reflect feelings of concern for the environment” (MoE, 1999, p. 9). A second key concept of EfS in New Zealand schools discussed in this section is that of personal and social responsibility for action, and the notion that environmental quality relies on the everyday actions of individuals (MoE, 1999, p.13). Attitudes and values of care and concern demonstrated by staff and students for the environment may help to enable the whole school approach to EfS.

The EfS Facilitator led a discussion around the values-oriented question “How can we care for *our* school environment?” Ally then brought up the new values - based school rule that they had recently adopted: “How can we care for ourselves and each other and our environment?” and discussed how it could be made to relate to education for sustainability, with links to their global focus. Ally went on to talk about the attitudes and values relating to caring for the environment and oneself, and how students would be asked to think about “what is *their* role?” i.e. it’s not someone else’s job. Ally said that they wanted students to develop attitudes and values that would encourage them to take responsibility for their actions and the impact they had on their school for future students and staff. Brianna then coined the phrase, “We are the keepers of Ferndale School”, to use as their education for sustainability ‘motto’ and guide for actions. The EfS facilitator then introduced the idea of the school developing a ‘vision map’ to guide the students and staff on their EfS journey. There was general talk about using the phrase “we are the keepers of Ferndale school” as a ‘vision’ instead. This led the discussion back to the idea “what do we love about Ferndale school?”

The EfS Facilitator also talked about how the concept of care tended to always be a current focus and how there needed to be the idea of caring for the school/environment both now and in the future, and she went on to relate this to the Māori Guardianship concept (Meeting observation, 28/11/08). The notion of responsibility is reflected in the Māori concept of kaitiakitanga (guardianship), an environmental management approach to protect the mauri (life-force) of the taonga (things and places of special significance – treasures) and hence ensure the sustainable use and management of natural and physical resources (MoE, 1999). Ally suggested that each class could choose a book relating to the idea that ‘everyone counts’ and develop a term theme. She also suggested that students could do a statistics project/survey about areas of the school that students want to care for. Ally felt it would be a useful concept for a given year level (e.g. Year 4, Year 5 students etc...) to care for a part of the school for the same year level next year, e.g. Year 4 students could look after a part of the school for the Year 4 students in the next year. This links clearly to the EfS idea of intergenerational equity. The EfS facilitator drew on Ally’s ideas and talked about fruit trees, i.e. that students plant fruit trees for future students at the school. Ally then talked about introducing to their students the concept of what they can leave behind instead of what can they get out of it, furthering the notion that EfS crosses the generations of students attending the school (Meeting observation, 28/11/08).

There was a discussion during the meeting regarding the school’s emerging focus of the Key Competency ‘managing self,’ and how responsibility for the environment links to the other Key Competencies in the New Zealand Curriculum (MoE, 2007, p.38), and how they linked to EfS through caring for the environment. Ally talked about the possibility of using De Bono’s ‘Thinking Hats’ to cover all the Key Competencies. She asked the group, “what kind of ‘thinking’ did they want to develop?” e.g. inferential thinking. The EfS Facilitator added ‘reflective thinking’ to the staff list they were creating about different types of thinking. Ally talked about how for each Key Competency they could have a key question relating to ‘managing self’, e.g. What have we done in the past? Do we need to make any changes? This was followed by a general discussion of key EfS questions relating to each of the Key Competencies and

how they linked to the big focus. At this point the EfS facilitator brought back the concept of guardianship and Māori aspects and concepts of care. This returned the discussion amongst the group to the relevance of the “we are the keepers of Ferndale school” motto. This appeared to round out the thinking of the group as to the connections between EfS and their curriculum planning.

The discussion then moved to a consideration of ownership and participation. Ally talked about each room sharing what they have done in terms of EfS with the rest of the school and also that they could make badges that say “I am a keeper of Ferndale school!” for the students to wear. The EfS facilitator talked about how they could direct the students to want to come up with the badges idea themselves, apparently trying to make it clear to the teachers that the exercise should become student-directed rather than teacher-directed.

At the conclusion of this meeting with the EfS Facilitator, Brianna and Ally talked about where they should go from there, i.e. what they should do following the meeting. The EfS facilitator described a few more EfS activities that the staff could use to find out what children’s thoughts were on EfS issues, e.g. using continuum lines for children to stand on to show what their thoughts were, and discussion was raised about De Bono’s ‘Thinking Hats’ again (de Bono, 1985). Brianna was given the role of producing notes from the day’s discussion for the other two teachers who had not attended the meeting. Issues were raised about road safety for students, where students could be in the school when they came early for school, and how the school could go about creating an outdoor shelter for eating lunch. Ally suggested that at the end of each term each class could engage in an ‘action’. The EfS Facilitator talked about the importance of the school celebrating what they had now, and identifying the things they needed. Ally and the EfS Facilitator noted the importance of knowing how to “sustain the sustainability”, i.e. how to maintain EfS in the school.

5.3.3 Teacher views on planning the EfS programmes in their school

At the beginning of Ferndale School’s EfS journey, in March 2009, two formal interviews were held with Ally, the school principal, and Brianna, the lead EfS

teacher. During her interview, Ally explained that they had a skeleton framework in place to help them integrate EfS into their programmes (Formal interview, Ally, March 2009). Brianna said that “we’ve developed a vision and we’ve developed a broad understanding of where we want to go” (Formal interview, Brianna, March 2009). Brianna went on to say that up to that point (during the first term of integrating EfS into the school programmes) they had spent some time setting up school rules relating to caring for the environment, e.g. not breaking branches, then they (the teachers and their students) had gone on to looking at what ‘environment’ means. At the point of interview (March 2009), it seemed that most of the classes were getting onto the subject of sustainability and discussing what it meant to them (Formal interview, Brianna, March 2009). It appeared that developing attitudes of care and concern and building student knowledge and understanding around sustainability were seen to be of paramount importance at this stage in the development of the whole school approach to EfS (MoE, 1999).

When asked what teaching approaches they felt would be the most useful in EfS, Brianna responded:

...problem solving I guess... I guess the kids are going to have to do a lot of ‘hands-on’ finding out for themselves and if it really does work or not. . . there’s going to be a lot of researching, and there’s going to be a lot of ‘interrogating’ almost. . .you know. . .there’s going to be a lot of asking the community experts to come in and teach the children or to inform them, you know, fill them up with information so that they can then use that information and relate it to other things.

(Formal interview, Brianna, March 2009)

Ally’s thoughts on relevant teaching approaches for EfS were that it should probably be an inquiry-type approach, where the students came up with suggestions. She also felt that maybe the students would benefit from being prompted by the teachers with some open questions that might stimulate their thinking. Ally also thought that the students would need to work in groups so that they could collaborate in a problem-solving type approach (Formal interview, Ally, March 2009). Brianna expressed concerns about ‘letting the kids do the

planning', and not being able to plan their classes as they had done in previous years (Formal interview, Brianna, March 2009):

It is really weird. . .and I mean, normally we have, you know, this is the music plan and this is where we're going and this is the art plan and this is where we're going, and you relate it back to each topic that you're doing, but because we don't know what the topic will be next term, except that it's going to be on the environment and working out the visions plan, you know, we can't do much. . . so. . .for us as teachers it's quite scary because we can't plan too far ahead because the kids have to do it all.

(Formal interview, Brianna, March 2009)

Student-centred learning approaches are in alignment with a key aspect of EfS programmes which suggests the use of student-centred learning approaches where students gain competencies by initiating their own learning (Enviroschools, 2014), and thus could help enable EfS successfully within the school. While both staff members acknowledged that student-centred learning approaches were important in EfS, Brianna appeared to be struggling with the idea of giving the students 'more control' over their learning.

In terms of curriculum delivery, Ally thought that there was a place for EfS to sit outside of their literacy and numeracy programmes, and that it could be incorporated through their other curriculum areas, such as science, social studies and technology. She saw the science, social studies and technology curriculum areas as vehicles through which to weave EfS, and she felt that integrating EfS with these curriculum areas would prevent EfS becoming divided into isolated little bits of learning. Ally seemed to consider it important to teach the 'scientific' aspects of EfS as an independent topic, and thought that the students would benefit from participation in projects such as studying native animals, e.g. weta life cycles and their environment, and endangered species and what food could they [the students] give them to sustain them. She also thought it might be interesting for the students to be involved in EfS 'activities' such as building weta houses and bird feeders (Formal interview, Ally, March 2009). Brianna said that she thought that EfS was definitely going to be integrated into the curriculum.

While she considered this to be manageable with the middle and senior school students because of their reading and writing abilities, she expressed concern with respect to the junior classes:

...with the juniors it's really hard to integrate some things though because, for example, reading is dictated by levels and those levels, you know, books are already stipulated there and until children can read and actually research a certain thing we have to do those levels and so it's really hard to integrate... Maths is a lot easier... um... but reading, and even writing to a certain extent, I mean, you can, it's a bit easier to integrate into writing than it is reading, but children have got to learn how to write first before they can go away and start.

(Formal interview, Brianna, March 2009)

Within the 'Programmes' key area of schooling life, as outlined by Enviroschools, sustainability is considered to be a core part of the formal curriculum: it is recommended that a whole school curriculum plan includes cross-curricular learning for sustainability projects and the merging of sustainability into curriculum areas (Enviroschools, 2009) . However, at this stage of development both Ally and Brianna seemed to consider EfS to be mainly a 'topic' for the older students (9 and 10 years old) who had greater reading abilities to study within a few selected curriculum areas such as science, social studies and technology, which could possibly inhibit the integration of EfS into the school.

5.3.3.1 Teaching and assessment in EfS

When it came to talking about assessment in EfS, Ally said that she thought that one needed to be very thoughtful about how they were going to measure the effectiveness and that it did not need to be assessed against a written 'check-list' (Formal Interview, Ally, March 2009). Ally went on to suggest ways in which she thought they could assess EfS:

...by the way they [the students] present their outcomes... and long term what impact it would have on changing their behaviour and their thinking... has it gone into the environment, have they managed to sell the idea to their parents and the wider community... how much involvement have they got in it... what

feedback do we get from parents and the community about what we're doing.

(Formal interview, Ally, March 2009)

Ally also wondered if they could measure 'progress' in EfS by looking at the physical environment of the school, possibly by taking photographs and videos to measure litter reduction (if any) over time (Formal interview, Ally, March 2009). Other forms of assessment in EfS Ally suggested included feedback from families, student self-assessment using 'smiley faces' to grade how they think they have been doing, and teacher observations of 'then and now' type situations.

Brianna's first response when asked about assessment in EfS was that she 'hated assessments' and that they were more relevant in secondary than in primary schools. She seemed to feel that assessment was only really useful if she was going to use the data to help the students with their future learning (i.e. formative assessment). However, she did feel that it could be beneficial for their students to undertake assessments on relevant issues such as how much litter the school produces, for them to examine how they went about finding this out, and what action(s) they might have needed to take as a result of their findings? Brianna also thought it would be good if the students came 'on board' more in terms of assessing themselves and their learning (Formal interview, Brianna, March 2009).

The forms of assessment suggested by Ally and Brianna correspond to many of the questions proposed by Enviroschools (Hamilton City Council, 2001) that encourage staff and students to 'reflect on change', such as 'what went well?', 'what didn't go so well?' and 'how can we monitor and record changes?' This is likely to act as an enabler in the school's planning of EfS.

5.3.4 'Programmes' summary

The primary purpose of the first meeting with the two of the senior staff and the EfS Facilitator in August 2008 appeared to be to set the scene in terms of planning the teaching programmes for Term One. The EfS facilitator introduced to the teachers several planning documents in which they could integrate EfS into

their teaching programme, which could act as enablers in the schools's EfS integration.

Discussions revolved around EfS 'topics', such as "what is an environment?" and "what could they learn from their own school environment?" The teachers were also interested how they could instil attitudes and values in their students that would prompt them to care for their environment at school, both for them now and for future students, which could also act as an enabler.

The teachers felt they needed to build the students' limited knowledge and understanding about basic biological concepts prior to engaging in EfS. Limited knowledge about basic biological concepts could act as an inhibitor to student's learning in EfS. At this point in time, the teachers appeared to consider EfS primarily as a 'science topic' or 'nature study' for older students with greater reading skills to be studied within curriculum areas such as science, social studies and technology. This could also act as an inhibitor to the school's integration of EfS. They thought that the teaching approaches they would probably use when 'teaching' EfS would include problem-solving, 'hands-on' learning and inquiry-type learning, which could help enable the whole school approach. The teachers did express some concern about having reduced control over lesson planning, and allowing the students 'do' most of the planning.

A range of different EfS assessment methods were suggested that were, for the most part, in alignment with the Enviroschools' 'reflect on change' section of their 'action learning cycle' (Hamilton City Council, 2005). These assessment methods could help enable the whole school approach to EfS.

5.4 Practices

School 'Practices' form one of the four key areas of schooling life that may have an effect on planning for sustainability and student learning in a whole school approach (Enviroschools, 2014). These practices include the policies and systems that are in place within the school. Energy conservation, and waste and recycling were identified during the preliminary meetings in November 2008 with the

school staff and EfS facilitator, and also in the interviews held with Ally and Brianna in March 2009.

In November 2008, during the planning of the whole school approach to EfS, Ally and Beth had a discussion during a staff meeting about the possibility of having days where no paper resources were used, to increase awareness of the use of the photocopier and other forms of paper in the school, such as lunch wrapping (Meeting observation, 28/11/08). Ally suggested that the teachers could each have an 'action', e.g. everyone at school could take their rubbish home on a given day. Ally and Brianna mentioned that there was a parent helping with care-taker activities periodically at the school. Ally also talked about having 'activities' relating to sustainable practices for the students, e.g. compost bins or chickens at school. There was discussion between Ally, Brianna and the Facilitator about holding a waste audit at Ferndale School, and that they could have 'student monitors' to undertake the audit. Ally further talked about having an 'evidence driven waste audit' and wanted the students to think about 'what happens now?' Ally was also interested in having students act as 'energizer bunnies' who would go around and turn unused electrical appliances and lights off. Ally, Brianna and the Facilitator had a general discussion about the possibility of students keeping a record of resources used e.g. each student has their own box to keep used paper in (Meeting observation, 28/11/08).

In March, 2009, Ally and Brianna were asked during individual interviews about EfS practices relating to the concept of a whole school approach to EfS. Both Ally and Brianna indicated that they probably needed to review their own use of teacher resources such as paper and photocopying. This appeared to be driven primarily by cost factors (Formal interviews, Ally & Brianna March 2009). Ally didn't feel that the school's water resources were being sustainably managed, but she seemed to consider the water filter they had had installed recently to be 'helping sustainability'. She said that they (the staff) had considered energy conservation within the school, and that they had talked about students having the role of 'energizer bunnies' who went around checking that unused power switches were off, but she also pointed out that they, as staff, didn't want to come up with energy saving ideas etc entirely by themselves. They wanted to encourage the

students to come up with ways to save power and other resources within the school (Formal interview, Ally, March 2009).

Although sustainable practices did not feature greatly in meeting observation data, it seemed that staff recognised the importance of waste minimisation, wise use of energy, composting of food waste, and care of water resources. They also noted that these practices need to be monitored over time, with progress being made towards sustainability, which is in alignment with Enviroschools philosophy (Enviroschools, 2014). Engaging in sustainable practices could help enable the school's integration of EfS, particularly as it is part of the hidden curriculum. However, the staff did not appear to understand how to address sustainability issues surrounding practices at a more in-depth level, which could act as an inhibitor to the development of the whole school approach

5.5 Place

Enviroschools recognise 'Place' as an important aspect of schooling life that can have an effect on sustainability and student learning. According to Enviroschools philosophy, a school engaged in a whole school approach to EfS would aim to demonstrate the following:

- buildings and grounds within the school which reflect the culture and heritage of the place
- grounds that demonstrate how ecosystems work
- buildings and grounds that are a learning resource and designed to work with natural systems.

(Enviroschools, 2014)

While aspects of 'Place' did not feature greatly in the early stages of the development of a whole school approach to EfS, the teaching staff did recognise that the area of native bush at the back of the school grounds was an area ('out of bounds' to students at that time due to destructive behaviour of some students in the past) that could be addressed and 'improved' to allow it to become a learning place for students (Meeting observation, 28/08/08).

The EfS Facilitator commented that she felt that in terms of ‘place’, the school could enhance their native bush area, make ‘better’ use of the large area of open space they had immediately around the school and the fact that they were in a rural environment. She also noted that entrance to the school has ‘wharenuī-like’ (Māori word for ‘communal house’) properties and seemed to consider this to be an attribute in the development of a whole school approach to EfS (Formal interview, Beth, February 2009).

It appeared that at the planning stage of the whole school approach to EfS, the teaching staff were restricted in their views of ‘place’ to the external environment only (i.e. the native bush section of the grounds), and how this could be developed for student learning about sustainability. The school buildings and how they could be developed and utilised to assist in learning about sustainability did not appear to be recognised by staff at this stage. This limited acknowledgement of ‘place’ could serve to inhibit the development of EfS within the school.

5.6 Chapter Summary

This Chapter has provided an outline of the themes that emerged in terms of ‘people, programmes, practices and place’ during the planning phase of the school’s development of a whole school approach to EfS. It also highlighted factors that may act as enablers or inhibitors in the development of the EfS integration (See Table 5.1).

Table 5.1 *EfS Enablers and inhibitors to the whole school approach during the planning stage*

| EfS Enablers | EfS Inhibitors |
|---|---|
| Teacher interest. | Lack of teacher professional development and learning in EfS. |
| Presence of EfS Facilitator. | Limited staff understanding of EfS and EfS in practice. |
| Small size of school. | School not reflecting cultural diversity. |
| United staff interest in EfS. | Varying levels of involvement from the school community. |
| Enthusiasm to integrate bicultural aspects into school teaching and learning. | Teachers perceive EfS as a science ‘topic’. |
| Strong sense of belonging and ownership from parents/caregivers. | Limited understanding of the depth and breadth of the divisions of ‘People (and participation)’, ‘Programmes’, ‘Practices’ and ‘Place’. |
| An understanding of the importance of inquiry learning approaches. | |
| A basic understanding of sustainable practices. | |

The school leaders perceived sustainability as a relatively simple concept based primarily on maintaining something over time. They also understood that sustainability was related to systems and resources. The ‘human’ aspect formed the basis of the understanding of a whole school approach to EfS at this stage and the school leaders viewed their roles in EfS from the perspective of their positions within the school. Ferndale School’s overall position in terms of EfS was considered to be in the process of developing students’ knowledge and understanding of the environment, developing students’ awareness and sensitivity, and attitudes and values with respect to the environment and related issues. There appeared to be an awareness of the need for intergenerational equity and acknowledgement of the physical environment, or ‘place’, and the sustainability practices within the school. This somewhat limited understanding of EfS could act as an inhibitor to the planning of their whole school approach to EfS as it did not allow them to further explore other facets of EfS.

The small size of the school was considered helpful, i.e. an ‘enabler’ in allowing greater collaboration between staff and allowed all the staff to participate in leadership decisions during the planning stage of the development of the whole school approach. There appeared to be good participation from the school community in general school life.

At this early stage in the development of a whole school approach to EfS, the facilitator noted that embedding EfS within the ‘People, Programmes, Practices and Place’ aspects of the school was important and that this would help to enable their EfS journey. Within these four aspects, she considered it particularly important for them to address issues of staff cohesion, student ownership, and development of the teachers’ understanding of EfS beyond that of the physical environment only.

The multi- and bi-cultural aspects of the school’s community were not thought to be particularly well addressed and may have acted as inhibitors during the planning of the whole school approach. However, the Māori cultural concepts included in the Enviroschools programme (Enviroschools, 2014) were considered to be a helpful context for developing students’ attitudes of care and concern for the environment, i.e. possible ‘enablers’ to the planning of the EfS programmes.

There appeared to be varying perspectives on the levels of community support and involvement. Higher levels of parental and community involvement could potentially act as enablers during the planning phase, whereas lower levels of participation could potentially act as inhibitors.

Staff meetings during the planning phase allowed the EfS facilitator to introduce to the teachers several planning documents through which they could integrate EfS into their teaching programme, which could act as enablers in the school’s EfS integration.

The teachers felt they needed to build the students’ limited knowledge and understanding about basic biological concepts prior to engaging in EfS. The teachers appeared to consider EfS primarily as a ‘science topic’ or ‘nature study’

for older students with better reading skills to be studied within curriculum areas such as science, social studies and technology. Limiting learning in EfS to knowledge about basic biological concepts could act as an inhibitor to student's learning in EfS, however, it may also be a useful starting point from which to develop greater understanding of the complexity of EfS. The teachers were interested in how they could develop attitudes and values in their students that would prompt them to care for their environment at school, which could also act as an enabler and may have been the starting point for deeper investigation into the nature of EfS.

The teachers thought that the teaching approaches they would probably use when 'teaching' EfS would include problem-solving, 'hands-on' learning and inquiry-type learning, which could help enable the whole school approach. The teachers expressed concern about having student driven planning, and the lack of feeling of control that it gave them. A range of different EfS assessment methods were suggested that were, for the most part, in alignment with the Enviroschools 'reflect on change' section of their 'action learning cycle' (Hamilton City Council, 2001). These assessment methods could help enable the whole school approach to EfS.

Although sustainable practices did not feature greatly in meeting observation data, it seemed that staff recognised the importance of waste minimisation, and wise use of resources. They also noted that these practices need to be monitored over time, with progress being made towards sustainability, which is in alignment with Enviroschools philosophy (Enviroschools, 2014). Engaging in sustainable practices across all school systems can help enable to school's integration of EfS.

During the planning stage of the whole school approach to EfS, the teaching staff were restricted in their views of 'place' to the external environment only (i.e. the native bush section of the grounds), and how this could be developed for student learning about sustainability. The school buildings and how they could be developed and utilised to assist in learning about sustainability did not appear to

be recognised by staff at this stage. This limited acknowledgement of 'place' could serve to inhibit the development of EfS within the school.

The next chapter looks at the themes that emerge in terms of 'people, programmes, practices and place' during the implementation phase of the development of the whole school approach to EfS. Possible enablers and inhibitors to the process will also be identified.

Chapter 6

Implementation of a whole school approach to education for sustainability

6.1 Chapter outline

The data presented in Chapters 5 to 7 describes the planning, implementation and subsequent outcomes of the development of a whole school approach to education for sustainability (EfS) in a rural primary school during its first year. The data presented in Chapter 6 is drawn from observations of meetings (three staff meetings in March, April and May 2009, see Table 4.1) with the teaching staff and the EfS Facilitator, and individual formal interviews with the principal, lead EfS teacher and EfS Facilitator during the implementation phase of the development of the whole school approach. This data chapter also is subdivided into four key areas of school life that may have an effect on student learning in EfS: (1) Programmes; (2) People and Participation; (3) Practices; and (4) Place (Enviroschools, 2014). While content analysis was used in the research, the data was presented as a narrative of events from each of these four key areas (Cohen et al., 2011).

6.2 People (and Participation)

One of the four key areas of a whole school approach that can have an effect on sustainability and student learning are the people and their participation within the EfS programmes (Enviroschools, 2014). A school may not be able have every person in the school and its community involved, but it has been suggested that the greater the level of participation, the easier it is to create a sustainable school (Hamilton City Council, 2005). The following ‘People (and Participation)’ (hereafter referred to as ‘People’ for brevity) related themes were drawn during the implementation of the whole school approach: developing children’s thinking and participation around EfS; student responses to teacher-led EfS tasks; EfS professional development around EfS; teacher understanding of EfS; and the

development of EfS and EfS teaching practices during the implementation of the whole school approach.

6.2.1 Developing children's thinking and participation around EfS

During the early implementation phase the EfS Facilitator spent time in each of the classrooms (February, 2009, see Table 4.1). She appeared to be attempting to model to the classroom teachers various approaches they could use to develop students' reflective thinking and participation in discussions around EfS topics. The EfS Facilitator began the sessions with each class by telling a short narrative about herself as a child and growing up in a rural environment, similar to many of the students' home environments. The narrative included aspects of care for 'nature' and the environment. In an informal discussion with the EfS Facilitator between sessions, she informed me that she was starting each session with a 'story' in an attempt to create a meaningful connection between her and the students. Effective learning in sustainability is more likely to occur when the issues discussed are meaningful and relevant to the learner (MoE, 1999).

The EfS Facilitator attempted to develop each of the students' contributions to the discussion in several ways: by prompting them to be more specific, for example, 'healthy food' and 'vegetables' instead of simply 'food', and by asking them why they thought their suggestions were relevant (to their discussion topic 'being fit, healthy and safe'). She also prompted the students to think further about the responses they volunteered, for example, a student suggested 'roof', and the EfS Facilitator responded by talking briefly about the need for shelter and shade, and prompted the students to suggest 'rain' and 'sun'. This led to a discussion about being safe in the sun. By using her own knowledge and understanding of EfS, the EfS Facilitator appeared to be able to support the students to help them to think with greater depth and reflection, and possibly make connections between their own lives and the principles of EfS (MoE, 2007).

The EfS Facilitator appeared to be acting as an enabler in the implementation of the whole school approach to EfS by modelling to the teachers ways in which they could connect with the students and develop their reflective thinking skills around

EfS. The EfS Facilitator also seemed to be enabling the student's abilities to think with greater depth about the principles of EfS.

6.2.2 Student responses to teacher-led EfS tasks (and discussion)

During the implementation phase, teachers were asked during individual, semi-structured interviews (July, 2009, Table 4.1), how they thought their students had responded to the EfS tasks that they had participated in. Brianna (a teacher of Year 2 and Year 3 students) thought that their responses were:

...still very stilted... the other day I said to them, "what could I do to make your learning easier?" and they said, "well you could give us the answers"!... so they didn't quite get what I meant... so I guess we've just got to keep doing more and more of it, at the moment it's just very much sort of what they can see on the page is what they mean, they're not really reading between the lines... or applying it.

(Semi-structured interview, Brianna, July 2009)

Brianna also went on to say that there was a lot of enthusiasm from the students to join the 'envirogroup' that they were considering starting at the school (Semi-structured interview, Brianna, July 2009).

When asked if she felt the students were developing an understanding of EfS as a result of the EfS tasks that were being done at school, Brianna said she didn't think that they were at that stage. She thought this way because the students were:

...not saying things in class [like], "Oh, because we did that last time we might be able to do that this time", and because during the first term we worked on developing knowledge relating to sustainability... rather than inquiry sorts of things... so in the first term it was very... we didn't know where we were going. So at this stage I don't think they're really getting that whole concept.

(Semi-structured interview, Brianna, July 2009)

The responses from the teacher suggested that asking the students to reflect upon their learning (about EfS) was relatively new to them, and so the difficulties the students seemed to be having could have been due to limited practice in this type

of thinking. The students' relatively young age (6- and 7-year olds) may have also been a contributing factor in their apparent struggle to think more deeply about their knowledge and learning relating to EfS. They may have benefited from a different discussion strategy that was more appropriate for their age and level of understanding.

Jessica (a teacher of Year 3 and Year 4 students) felt that most of her students had responded positively to the EfS tasks they had been doing. In particular, the students had shown '100%' motivation when involved in designing the garden for the school. Jessica considered the students to be developing an understanding of sustainability because they seemed to be able to talk about it a bit more than earlier in the year (Semi-structured interview, Jessica, July 2009). Although this response was not especially detailed, it suggests that, overall, the EfS tasks occurring in the class were positive.

Sarah (a teacher of Year 5 and Year 6 students) thought that the interest level for the majority of her students in EfS had increased, and that they wanted to find out more about it because they felt more in charge of their learning. However, she commented that there were always going to be kids who just wanted to be 'told what to do', given the answers and given worksheets to complete. Sarah considered her students to be developing an understanding of what sustainability was, but felt that she still needed to improve her own understanding. When asked how she knew that her students were developing an understanding of EfS she laughed and said "We've got it on the board and we read it every day! . . . I can say to them now, is that a sustainable practice and they will say yes or no, and we can say "well what can we do to make sure it is sustainable.....?" (Semi-structured interview, Sarah, July 2009). These students (aged 9- and 10- years old) appeared to be developing a good understanding of the essence of EfS during this stage of the implementation of the whole school approach. This may in part have been due to their age and a correspondingly greater ability to comprehend complex concepts such as EfS and reflect with greater depth upon their knowledge.

It seemed that Brianna, who had a class of Year 2 and Year 3 students considered her students to be struggling with participating in EfS discussions, possibly

because of their young age and limited knowledge and understanding. Sarah (a Year 5 and Year 6 teacher) and Jessica (a Year 3 and Year 4 teacher) appeared positive about their students' responses to their EfS work, describing greater knowledge and understanding as demonstrated by students' ability to communicate effectively in EfS discussions and greater motivation to participate in EfS tasks. It was possible that the younger students may have benefited from EfS tasks and discussion questions more specifically tailored to their age and level of knowledge and understanding. Knowledge and understanding around sustainability is an aim of EfS which seemed to be being developed during the implementation of the whole school approach (MoE, 1999). An increase in student knowledge and understanding may assist in the students' ability to be active participants in group discussions relating to EFS. Participation is a key aspect of 'People' within a whole school approach to EfS (Enviroschools, 2014).

6.2.3 Professional Development around EfS

It seemed that implementing the whole school approach to EfS had been proving difficult at Ferndale school because the professional development with the EfS Facilitator was not consistently being done with all the staff at the same time, and that, as a group, they didn't know what direction to take at that point in time. Brianna commented at a meeting with the EfS Facilitator (Meeting observation, 27/05/09) that when information was passed along to other staff from the 'experts' who went to the professional development session, the information got 'diluted and misunderstood (Meeting observation, 27/05/09)'. She also felt that each staff member was operating in isolation and that there was no 'ownership' (of any EfS tasks being done within the school).

During a meeting (May, 2009, see Table 4.1) Ally and Brianna talked about how the New Entrant class was doing their own class work independently of the whole school approach to sustainability. Ally had mentioned that she had thought that it 'was enough' that each class did the 'same' thing, but in isolation from each other. Brianna also said that they had not done any group planning or had any group professional development that might assist with implementing EfS in the classroom. She said that she thought that, as a staff, they needed more cohesion

(Meeting observation, 27/05/09). Developing staff cohesion and a sense of ownership amongst the staff may have been inhibited by the observation that staff were not all receiving the same professional development in EfS when the EfS Facilitator was holding sessions in the school. Developing a sense of ownership is a key aspect of 'People' within a whole school approach to EfS (Enviroschools, 2014) and appeared to be only emergent at this stage.

6.2.4 Teacher understanding of EfS

During the early implementation phase (March, 2009) the staff met together with the EfS Facilitator to discuss the direction the classroom planning could take for Term Two. The EfS Facilitator introduced the staff to Hart's (1997) ladder of children's participation. Hart (1997) used a ladder as a metaphor to illustrate the different degrees of initiation and collaboration children can have when working on projects with adults. The lower rungs of the ladder show what is not participation (i.e. manipulation, decoration and tokenism), and the upper rungs of the ladder indicate increasing levels of initiation by children. Children can operate at one or more of the upper rungs of the ladder depending on their ability and interest in a particular project (Hart, 1997). The EfS Facilitator led a discussion around the concepts of tokenism and manipulation, and described Hart's ladder as a progression over time and as a "tick box" list for teachers to help clarify what level of participation their students were working at during a given 'project'. During the meeting Ally ranked the current levels of children's participation at the school towards the upper end of the ladder, whereas Brianna ranked the school towards the bottom of the ladder (Meeting observation, 02/04/09). In December 2009, in an interview (semi-structured) with the EfS Facilitator she specifically referred back to this particular meeting that occurred during the early implementation phase. She seemed to feel that:

...Ally thinks she understands more than she actually does...
...and when I showed her the Hart's ladder, and it was in the staff meeting and we looked at it, she placed the school well up that ladder. Brianna placed them well down the ladder, and again, the others weren't really given that opportunity... I asked a couple [of teachers] what, where they felt and why... but they didn't really comment, their answers were, off the top of my head, "we don't

know enough about it all”, that kind of answer... but Ally immediately went up to [gestures to the top of the ladder] ... same when we did the school reflection...

and I read a really interesting comment somewhere, and I don't know where I read it, that teachers that have the greatest understanding will mark themselves harder, you know, on a continuum from where they really are... those that have the least understanding will mark themselves higher... it had some justification around it...

(Semi-structured interview, Beth, 2009)

It appeared that the individual teachers possessed different levels of understanding relating to EfS which influenced how they perceived the integration of EfS into the school, and also how they perceived the EfS that the students were participating in.

Differing levels of understanding of EfS within the school community was also demonstrated by their responses to school EfS tasks. During this implementation phase the school had decided to plan a school garden. It emerged during a meeting with the EfS Facilitator that the principal was getting pressure to develop the garden with 'greater speed' from the school Board of Trustees as they did not consider the garden to be making sufficient progress (Meeting observation, 27/05/09). In a discussion with the EfS Facilitator around learning cycles and 'action inquiry' (MoE, 2007), Ally had commented that this type of thinking was all very hard and wondered (humorously) why they couldn't just start building a garden. When the EfS Facilitator indicated that what the school was involved in was not Environmental Education, but rather, sustainability, Ally said that she thought that sustainability was more about 'social things... and not about the environment at all' (Meeting observation, 27/05/09). These types of comments from the principal, (in addition to the lack of professional development opportunities for all the staff as described in the above section), and the pressure from the Board of Trustees, indicate that a whole school approach to EfS that recommends a whole school vision to sustainability, with decisions made with the involvement of the students, staff and other members of the community (Enviroschools, 2014), was not being fully implemented. Involving all staff, students (where practicable), and other members of the community such as members of the Board of Trustees, in decision-making is likely to make EfS

related projects such as school gardens take a greater length of time to eventuate, but that learning processes would be richer.

6.2.5 The development of teachers' understanding of EfS and EfS teaching practices

In July, 2009, semi-structured interviews were held with three of the staff members, Brianna (the lead EfS teacher), Jessica and Sarah. Each teacher was asked if their understanding of the term 'sustainability' (in particular, with respect to 'People (& Participation), Programmes, Practices and Place') had changed since the beginning of the year, how it had changed and why it had changed. Initially, Brianna said that it had not changed, but that it might do during the rest of the year. During the interview, Brianna referred back to this original question and concluded that actually her views on sustainability had changed:

...yes it has [changed] a little bit in terms of the environment... EfS when we first came on with it all it was 'Enviroschools' and I was thinking that we were going to be 'clean, green Enviroschools', but now I guess the word sustainability has really changed, because it's looking at teaching skills and sustaining the skills, rather than just looking at clean green practices... so I was probably thinking more of sustaining things in the school, like sustaining the bush, sustaining, having a nice vege garden or something like that, but, like we've just said, the skills... it's... yeah, so I guess it has changed a bit.

(Semi-structured interview, Brianna, July 2009)

It appeared that her views had changed from task-oriented actions in the environment towards the development of skills that enable students to act sustainably.

When asked to summarise what EfS-related activities they had taught or been involved in during the year so far, Brianna replied:

In the classroom we've looked at the mapping of areas that we need to. . . that we're not happy with... and areas that we are happy, but we haven't done anything with that as of yet. We've talked about

as a staff where we're going to next, so our planning, I suppose you could say is starting to become a bit more involved.

...this week we're going to get stuck into our bush activity...

And last term we tried to look at, I tried to 'feed them forward' with some... I tried to give them lots of information about plants and so forth... 'Front loading', that's the word... feed them up with information... so that's kind of what happened last term... but hopefully this term it's going to evolve a bit more.

(Semi-structured interview, Brianna, July 2009)

The focus at this stage appeared to be based around reviewing the condition of the school grounds, or 'Place', and around building students' knowledge and understanding of sustainability.

Brianna thought that her way of teaching EfS had changed since starting the whole school approach because:

... it is all about the way we teach rather than particularly the context it's in... or...although it is a context that it has to be in... no, that's not quite right either... um... I guess it's the whole questioning, and getting them to come up, like I've only got the juniors, but just trying to put across a topic or a concept and then trying to get them to come up with questions that they're interested in finding out about, and in the past we've always sort of said 'well this is the learning objective we want to get out of the kids and so we generate it so it's very much... 'contrived'...and the planning has changed, to how I teach now, I try and give a lot of open ended questions, I try and get a lot more feedback on how they've learnt things, was that successful, so more of the evaluating as we're going along... I guess I'm trying to do that more...

And I think that's also come from those wonderful courses that we've been doing with Beth.

(Semi-structured interview, Brianna, July 2009)

Brianna's understanding of EFS seemed to have developed beyond her initial ideas which were based around producing a clean and tidy environment, towards teaching and facilitating skills that would help enable EfS within the school. Skills relating to identifying, investigating and problem solving are recognised as one of the key aims of EFS (MoE, 1999). She also appeared to be focusing on developing her students' knowledge and understanding about the environment, which is one of the aims of EfS (MoE, 1999).

Sarah seemed to think that her understanding of sustainability hadn't changed much, except that now they (as a class) were looking at sustainability through their 'practices' and different aspects of it, although she didn't specify what those aspects were (Semi-structured interview, Sarah, July 2009). Sarah summarised her involvement as:

We looked at areas of the school that the students liked, and they had to say why they thought it was a good area of the school... we looked at areas of the school that they felt needed improving, and they had to show what they could do to improve it, and made a map on the classroom wall of the school. We've looked at what an environment is, and the different types of environment that are found at Ferndale school. Recently we've looked at habitats, and they've clarified the understanding that it is a 'natural habitat', so we discussed the fish at Kelly Tarlton's are in an aquarium habitat that is not their 'natural' habitat...

(Semi-structured interview, Sarah, July 2009)

When asked if her thoughts on teaching EfS had changed much since the beginning of the year, Sarah thought that no, her thoughts on teaching EfS had not changed much, and that she was still "doing it to be child-driven, pretty much a continuation of what we started with. . .because that's the school-wide approach we're taking. . .it's giving them ownership as well" (Semi-structured interview, Sarah, July, 2009).

It appeared that, during this part of the implementation stage, Sarah was concentrating on developing the student's knowledge and understanding in relation to EfS. Knowledge and understanding is one of the key aims of EfS (MoE, 1999). Having a sense of ownership is also an aspect of 'People' in a whole school approach as described by Enviroschools (2014).

Jessica said that she thought that she understood sustainability a bit better now, as a result of the professional development sessions with the EfS Facilitator, but she didn't elaborate on the details of her improved understanding (Semi-structured interview, Jessica, July 2009). Jessica explained that her class had been responsible for designing a new garden for the school. The students were asked to think about who they could get from the community to help with it and had spent

some time creating individual garden designs. Jessica went on to talk about how the class had a visit from a landscape designer who looked at their individual designs and talked to the students about the practicalities of actually implementing these designs in the small space that they had available. Jessica felt that the visit from the landscape designer was helpful and encouraging for the students. However, it seemed that at the time of the interview the garden project was on the 'back burner' as they were waiting for funding for the garden, and for the landscape designer to do a garden plan for them as the staff were struggling to translate the student garden designs into a unified, practical plan (Semi-structured interview, Jessica, July 2009).

Jessica thought that her views on teaching EfS were also pretty much the same since the beginning of the year. She said that they had started off right at the beginning with the whole school idea of 'this was the way we are going to do it', and she felt that it had worked well and so they had continued with that approach (Semi-structured interview, Jessica, July, 2009).

Sarah also seemed to be working on developing her students' knowledge and understanding with respect to EfS, and touched on one of the aims of EfS, i.e. skills, which involved the students identifying areas of their school which needed 'improving' (MoE, 1999). It seemed that, initially the students in Jessica's class were embarking on an opportunity for 'participation', by being given a chance to design a school garden, however it seemed that the teacher was limited in her abilities to help the students translate their garden designs into a reality. This resulted in the garden design responsibility being transferred from the students, to a landscape designer from the community. Student participation and involvement is both an aim of EfS (MoE, 1999) and part of the 'People' aspect of a whole school approach (Enviroschools, 2014). Whilst community involvement (i.e. the landscape designer) is also described in the 'People' aspect of the whole school approach (Enviroschools, 2014), it was uncertain in this situation how much more involvement the students would have continued to have with the development of the garden design after the project was apparently 'given' to the landscape designer.

Brianna appeared to put quite a lot of reflection into her response about how her EfS teaching had changed during the early implementation of the whole school approach to EfS, and seemed to consider the professional development meetings with the EfS Facilitator to be beneficial. Sarah and Jessica seemed to think that their EfS teaching had remained the same since the initiation of the whole school approach which could indicate that they were confident with their current understanding of EfS, or, perhaps had not in fact, developed a deeper understanding around EfS as the year progressed.

6.2.6 ‘People (and Participation)’ summary

During the early implementation phase, the EfS Facilitator spent time in each of the classes, apparently modelling to the teachers various approaches they could use to develop students’ reflective thinking and participation in discussions around EfS topics. The EfS Facilitator appeared to be acting as an enabler in the implementation of the whole school approach to EfS by providing professional learning experiences for the teachers.

Teachers were asked how they thought their students had responded to the EfS tasks that they had participated in. One teacher considered her students (Year 2 and Year 3) to be struggling with participating in EfS discussions because of their young age and limited knowledge and understanding. Other teachers (a Year 5 and Year 6 teacher and a Year 3 and Year 4 teacher) appeared positive about their students’ responses to their EfS work, citing greater student knowledge and understanding of sustainability as demonstrated by students’ ability to communicate effectively in EfS discussions and greater motivation to participate in EfS tasks. It was possible that the younger students may have struggled with EfS tasks that may not have been specifically tailored to their age and level of knowledge and understanding. Developing knowledge and understanding is an aim of EfS which appeared to be a focus during the implementation of the whole school approach (MoE, 1999) and may assist in the students’ ability to be active participants in group discussions relating to EFS. The nature of the knowledge and understanding is also key and what the students are actually learning may or may not support learning in EfS, i.e. are the students learning about

interdependence, sustainability, biodiversity and personal and social responsibility for action? (MoE, 1999).

Developing staff cohesion and direction, and a sense of ownership amongst the staff may have been inhibited by the observation that staff were not all receiving the same professional learning and development in EfS when the EfS Facilitator was holding sessions in the school. It was not clear that the professional learning sessions were given uniform priority by all the staff at this stage. Developing a sense of ownership is a key aspect of 'People' within a whole school approach to EfS (Enviroschools, 2014) and appeared to be only emergent at this stage.

It appeared that the individual teachers possessed different levels of understanding relating to EfS which influenced how they perceived the EfS tasks that the students were participating in. Comments from the principal, (in addition to the lack of professional development opportunities for all the staff as described in the above paragraph), and the pressure from the Board of Trustees, indicated that a whole school approach to EfS that recommends a whole school vision to sustainability, with decisions made with the involvement of the students, staff and other members of the community (Enviroschools, 2014), was not being fully implemented.

During the implementation phase some of the teachers' understanding about EfS and introducing it to the classroom seem to develop considerably, whereas others reported less change. Brianna's understanding of EfS seemed to have developed beyond her initial ideas which were based around producing a clean and tidy physical environment, towards teaching and facilitating skills that would help enable EfS within the school. The other two staff members, however, thought that their views on teaching EfS had remained the same since the beginning of the year. Several of these teachers also appeared to be focusing on developing students' knowledge and understanding about the environment, which is one of the aims of EfS (MoE, 1999). Skills relating to identifying, investigating and problem solving are recognised as one of the key aims of EFS (MoE, 1999) and were not apparent at this stage.

6.3 Programmes

The staff had several meetings with the EfS Facilitator during the implementation phase of the whole school approach to EfS, and the EfS Facilitator visited the separate classrooms in order to engage the students in discussion and model the discussion method(s) for the teachers. During these meetings a number of themes relating to the ‘Programmes’ area of schooling life became apparent: the concept of EfS as an over-arching framework (as opposed to being taught as a ‘separate’ subject in addition to the existing curriculum); the ‘Action Learning Cycle’ (Hamilton City Council, 2001) and ‘Teaching as Inquiry’ (MoE, 2007) processes; EfS tasks that the students participated in with the EFS Facilitator; student-centred learning; developing student knowledge and understanding; and creating a whole school vision map.

6.3.1 Planning the curriculum for Term Two: EfS as an over-arching framework

The EfS Facilitator met with the staff in early April 2009 to assist them in their planning for Term Two. During this meeting in the implementation phase, the EfS Facilitator talked about the importance of EfS being an over-arching concept that integrates all aspects of EfS into the curriculum. She explained that she wanted Ferndale school to develop as a learning community in the context of the environment. This is in alignment with the ‘Programmes’ aspect of a whole school approach to EfS as described by Enviroschools (Enviroschools, 2014), where sustainability is described as being a core part of the formal curriculum which includes cross-curricular learning for sustainability projects and infusion of sustainability into curriculum areas. She recommended that the staff do not designate tasks to the students or individual classes during the implementation phase. The staff appeared to be struggling with the concept of integrating EfS into the curriculum, and seemed to want to teach EfS as an additional learning area instead of integrating it with the existing curriculum topics. For example, Ally expressed an interest in including a parallel science unit during the term, and also suggested the use of a ‘heritage’ context for their EfS studies. The EfS Facilitator explained how different sub-contexts can be put within the larger context in terms

of EFS. The Facilitator mentioned to me in an informal conversation during the session, when the staff were not present, that she felt that the school was heading into the 'Environmental Education' area rather than sustainability embedded into the curriculum (Meeting observation, 02/04/09). By this I understood her to mean that the staff were teaching students *about* the environment in a manner similar to traditional Environmental Education, through 'topics' such as 'nature studies', e.g. studying a native bird. While teaching students *about* the environment is an aspect of traditional 'Environmental Education' that can be described as one of the key dimensions of Education for Sustainability, education *in* and *for* the environment are also considered necessary to be included in a balanced EfS programme (Barker & Rogers, 2004; MoE, 1999).

During a meeting with the EfS Facilitator and the staff in May 2009, Ally expressed concern about time constraints and how the time spent on their existing numeracy and literacy programmes could not be reduced i.e. reduced to allow time for inclusion of EfS as an additional learning area. The EfS Facilitator explained that EFS could be integrated into numeracy and literacy activities such that the students' learning in these areas was not compromised. Ally agreed with this, and cited garden labels as a task that the students could create as an example of integrating EfS and literacy. Both Ally and Brianna said that it was hard for the teachers to change the way they had always taught, i.e. teaching traditional 'topics'. The EfS Facilitator talked about how the 'new' curriculum (MoE, 2007) prompted revision of teaching approaches (Meeting observation, 27/05/09).

In a task that attempted to assist the staff in recognising aspects of the curriculum in EfS projects in schools, the EfS Facilitator presented Brianna with a selection of laminated photographic prints taken at participating envirohools and asked her to select a photograph of her choice. The EfS Facilitator then asked Brianna how she interpreted her chosen photograph in terms of the key competencies, principles and vision within *The New Zealand Curriculum* (MoE, 2007). The EfS Facilitator went on to describe how this type of exercise could be useful to do with the school's Board of Trustees to help them understand what learning is coming out of the EfS tasks that the students are participating in, e.g. making a garden at the school (Meeting observation, 27/05/09). There appeared to be a

general feeling amongst the participants of the meeting that there was a need to ‘upskill’ the teachers and members of the school’s Board of Trustees, that the school needed a plan/direction, and that they needed to work out how to deal with funding/Board of Trustee issues.

In sum, the infusion of sustainability into the curriculum was a recurring theme that was brought up by the EfS Facilitator during her meetings with the staff in the early implementation phase, and corresponds to the ‘Programmes’ aspect of a whole school approach to EfS. Teaching EfS as a separate ‘subject’ or topic may act as an inhibitor in the development of a whole school approach to EfS as it is not in alignment with the ‘Programmes’ area of school life as described by EnviroSchools (EnviroSchools, 2014), which recommends that EfS is infused into the curriculum.

6.3.2 Action plans and teaching as inquiry

During a meeting with the staff towards the end of May 2009, in the early implementation phase, the EfS Facilitator discussed with Ally and Brianna the ‘Action Learning Cycle’ documents from the *EnviroSchools Kit* (Hamilton City Council, 2001) (Appendix 14) and the ‘Teaching as Inquiry’ flow chart (MoE, 2007, p.35) (Appendix 15). The EfS Facilitator talked about how to develop an ‘action plan’ and embed EfS into the curriculum and the importance of teachers inquiring into their own practice. During this discussion Ally commented that this type of thinking “is all very hard. . . why can’t we just get out and build a garden! (laughs)” (Meeting Observation, 27/05/09). As a result of this discussion, Ally and the EfS Facilitator started working on a preliminary action plan that would operate on a two year cycle (Meeting Observation, 27/05/09). An action-oriented approach to teaching EfS is recommended by the *Guidelines for Environmental Education in New Zealand Schools* (MoE, 1999).

6.3.3 EfS facilitation around tasks in the classroom

During the early implementation phase the EfS Facilitator visited each classroom to engage the students in EfS related tasks. The classroom teacher remained in

the class while the EfS Facilitator led the students through the tasks and discussions.

On the 19th of February, 2009, the EfS Facilitator led a discussion with the New Entrant class. One of the purposes of the visit appeared to be to develop the students' vocabulary of sustainability by asking them to think about the things they needed in order to be healthy and safe. An additional purpose of the visit seemed to be to prompt the students to reflect upon the notion of care for the environment. During the discussion the EfS Facilitator prompted the students to contribute 'suggestion' words, e.g. air, trees, rain and sun, which she then wrote up for the class to all read together. She then introduced the word 'environment' to the students and led a discussion about what the students thought it might mean. This was followed by prompting the students to think about whose job it was to look after the environment. The idea of 'care for the environment' was further developed by reading the story *One Child* (Cheng & Woolman, 1997) to the students (Classroom observation, February, 2009).

Also on the 19th of February, 2009, the EfS Facilitator visited the Year 3/Year 4 combined class, again with the teacher present. One of the aims of the visit seemed to be encouraging the students to think about the differences between their 'wants' and 'needs'. The EfS Facilitator talked to them about how children all over the world have the same 'needs', (e.g. food, water, shelter). She also introduced the word 'environment' to the group and asked for the students to think about words that they thought related to the word 'environment', e.g. whole world, outdoors, sun, trees and flowers. The EfS Facilitator prompted the students for a few additional words, such as 'air' and 'water'. The EfS Facilitator used an apple to represent the small globe she showed to the students, and gradually cut it into smaller sections designed to lead the students in a discussion towards the very small amount of land on the Earth that people could actually live on (i.e. their environment), and then talked with the students about what they could each do to help look after this limited space that they had to live on. As with the previous group of students, the idea of 'care for the environment' was further developed by reading the story *One Child* (Cheng & Woolman, 1997) to the students (Classroom observation, February, 2009).

The EfS Facilitator also visited the two remaining classes in the school, one comprising Year 4/Year 5 students, and the other comprising Year 5/Year 6 students on the 19th February, 2009. In both of these classes the EfS Facilitator started off the discussion with the students by asking them if they liked playing outside and prompted the students to suggest that the outside space was called the ‘environment’. The EfS Facilitator talked about outside and inside spaces for learning and led the discussion towards the outside environment being a place for learning, in addition to their inside classroom. The EfS Facilitator led the discussion further towards the concepts of everyone needing healthy food and water and a healthy environment to live in, prompting the students to contribute that it was everyone’s job to look after the environment and help to keep the air and water clean and healthy (Classroom observation, February, 2009).

The next task that the EfS Facilitator asked the students to engage in involved the class sitting in a circle around a large (roughly 1.5m) blue material circle with a map of New Zealand painted on it and a selection of small objects on top, such as shells, pinecones, plastic animals, stones etc. . . The students were asked to look at the pile of small objects and think for about 20 seconds and then when instructed to, choose a small object that had some sort of special meaning to them. The EfS Facilitator then asked each student in the group, one at a time, to talk briefly to the group about why the object was important to them, and after each student’s suggestion the EfS Facilitator made a link from what the student had said to a corresponding aspect of sustainability/the environment (Classroom observation, February, 2009).

The final discussion that the EfS Facilitator led with the students from both classes involved the ‘apple and globe’ demonstration, mentioned in an earlier paragraph in this section, whereby the students were prompted to imagine that the apple represented the globe (i.e. Earth) and to contribute to a discussion based around the fact that there is very little land on the Earth that people can live on and that it is everyone’s responsibility to care for this land (Classroom observation, February, 2009).

The EfS Facilitator concluded the sessions with both classes with a story, told from memory, of a little boy walking along the beach who found hundreds of starfish washed up on the sand. In the story, the little boy went along the beach throwing a few starfish back into the sea as he walked along. During the narrative, the boy was asked by an adult ‘what difference could he possibly make as he couldn’t save all the starfish on the beach’, upon which the boy threw another starfish back into the sea and replied that ‘he’d made a difference to *that* one’. The purpose of the story appeared to be that although we, as individuals, may not be able to do a huge amount for the environment, we can do small things, and that every small action counts (Classroom observation, February, 2009).

There appeared to be at least two aims within these sessions with the classes: to model to the teachers different styles of discussion that may help to prompt the students to think more deeply about their environment, which is in accordance with the ‘programmes’ aspect of a whole school approach to EfS where the teacher role becomes one of facilitating learning and inquiry (Enviroschools, 2014); and to probe the students’ thoughts with respect to the concept of environment, and to encourage the students to think about personal and social responsibility for action, which is one of the key concepts underlying EfS, as described by the *Guidelines for Environmental Education in New Zealand schools* (Ministry of Education, 1999).

6.3.4 Student-centred learning

During the meeting with the staff in early April, 2009, the EfS Facilitator talked about how the staff could encourage the students to come up with questions about what to do with parts of the school, i.e. getting the students to be involved in their learning. There was a general staff discussion about different plants and planting activities, e.g. Who does what? How? Do they create a cultural garden or ‘quiet garden’? Ally talked about bringing an old local building (the local tennis ‘clubrooms’) for a ‘quiet area’ into the school, she also brought up the point that students had emailed the local council regarding the overgrown grass by the school because balls get lost in it (Meeting observation, 02/04/09). Student-centered learning approaches are recommended by Enviroschools (Enviroschools,

2014) in order to help students gain competencies by initiating their own learning. This type of learning approach could be considered an enabler to the development of a whole school approach to EfS.

6.3.5 Developing student knowledge and understanding

During a staff meeting with Ally, Brianna and the EfS Facilitator, at the beginning of March, 2009, Ally updated the EFS Facilitator on what the teachers had been doing so far during the term, i.e. during the early implementation phase. It appeared that Brianna (in the role of EfS lead teacher) had suggested that the classes all start with a focus on the local school environment (i.e. the natural environment). During this early part of the year, the New Entrant class (5-year-olds) had apparently been learning about ‘the environment’ by talking about the ‘Living World’, specifically recognising the requirements that all living things need in order to survive, and that living things are suited to their particular habitats, i.e. Science at Levels One and Two as described by the *New Zealand Curriculum* (MoE, 2007). The EfS Facilitator, Beth, suggested that for this class they could spend some time talking about the classification and labelling of things such as ‘rubbish’, animals and plants (Meeting observation, 10/03/09), which could assist the development of their language and understandings of the many ways in which the natural world can be represented.

The discussion then moved on to what could be done in the Year 2/Year 3 (6- and 7-year-olds combined) class with respect to EfS. Ally said that ‘so far they (the students) have a better development of the concept of sustainability and the environment’, but it was not clear whether she meant that they had improved their understanding of sustainability since the beginning of the year, or that they had a better understanding than the class of five year olds previously discussed. Beth suggested that the students get involved in research into issues such as waste at the school, and present the findings to the school at assemblies, in addition to inserting a report for the community into the school newsletter, i.e. the students could be making links to the Science Curriculum Levels One and Two ‘Participating and contributing: exploring and acting on issues that link their science learning to their daily living’ (MoE, 2007). Beth went on to say that there could be a whole school audit, and that all classes could get involved and present

findings to the school and community (via the school newsletter), but Ally said that she wanted to wait until the students suggested the idea themselves (Meeting observation, 10/03/09). This comment by Ally is in alignment with the 'Programmes' aspect of a whole school approach to EfS, whereby student-centred learning approaches are used, and students initiate their own learning (Enviroschools, 2014). It indicates some understanding on the part of the principal of what constitutes good EfS practice.

The next class that came up in the discussion was the Year3/Year 4 (7- and 8-year-olds combined) class. It seemed that they had been working on bringing the focus of their studies from global ecosystems to local ecosystems and specific habitats. Ally talked about needing to keep all the students on track for a 'whole school focus'. The final class discussed during the staff meeting with the EfS facilitator was the Year5/Year 6 class (9- and 10- year-olds). It seemed that they had been involved in brainstorming ideas associated with recycling rubbish and becoming familiar with the vocabulary of sustainability (Meeting observation, 10/03/09).

During another meeting with the EfS Facilitator towards the end of May, 2009, Brianna explained to the Facilitator how their classes were all 'up in the air. . . just trying to feed them up with knowledge...juniors are growing seeds, Y2/3 are looking at plants, Y3/4 are looking at paths and materials, Y5/6 are looking at hard materials, what rusts etc. . .' Based on how the teachers were talking, it seemed that the students had a very limited knowledge of anything related to sustainability or the environment (Meeting Observation, 27/05/09).

At this early implementation stage the school's EfS programme appeared to be focusing on building student knowledge and understanding, which is one of the key aims of EfS (MoE, 1999) and can act as an enabler in the implementation of the whole school approach. As a part of these discussions with the staff, the EfS Facilitator talked about the importance of balancing knowledge with action, and that it was not enough to have knowledge unless it could be put into 'action', and in turn, it was not good enough having an 'action' if you don't know why you are doing it (Meeting Observation, 27/05/09).

Knowing about and understanding the natural and built environments and the holistic nature of EfS is also one of the key dimensions of Education for Sustainability, (i.e. education *about* the environment). Knowledge about the environment can contribute to helping students establish their own environmental attitudes and values (MoE, 1999). Indications of education *in* the environment and education *for* the environment were not yet apparent during this early implementation stage.

6.3.6 Creating a whole school vision map

As part of the discussions with the EfS Facilitator during the implementation phase, it appeared that school vision maps were being created in each of the classes (Meeting observation, 10/03/09). A vision map is a broad picture which the school staff and students could use as the basis for creating a sustainable school environment, and indicates the sustainability qualities that the school aims to create (Hamilton City Council 2001). It typically shows an aerial view of the school and indicates important links to the school's community. The vision map should show the principles and values that the school fosters as a sustainable school. A vision map can be used for:

- prioritising class projects;
- raising community awareness of school environmental goals and values;
- highlighting principles or issues that need to be considered when making decisions;
- inclusion in funding applications for sustainability projects;
- reflecting on and monitoring progress.

(Hamilton City Council, 2001)

It seemed that at Ferndale school, each class was working on a map independently to each other, although the New Entrant class was not involved. During a staff meeting on the 10th of March, 2009, the EfS Facilitator had recommended activities relating to vision mapping that the New Entrant class could engage in,

such as creating a whole school vision map using photographs and adding captions and labels, and taking only the New Entrant students on a Ferndale school 'trail' and using their senses to describe the environment. The EfS Facilitator also suggested discussion questions that were aimed at the five year old age group, such as 'what do we value?' and 'what do we want to change?' In an informal talk with the New Entrant teacher, prior to the school embarking on its EfS journey in 2009, she indicated that as she was close to retirement, she was probably not going to be directly engaging in any 'new' teaching direction (i.e. EfS) with the students. Possibly as a result of this, the New Entrant teacher had declined to be involved in this study and may not have engaged in any suggested activities.

When the staff were discussing the progress of the Year 3/Year 4 class during their staff meeting in early March, the EfS Facilitator advised them that they needed to record what the school 'had' already at that time and record it on their vision map before moving on to what they wanted to happen. As a group the staff went on to discuss ways to approach the creation of a vision map so that the 'whole school' could participate. The practicalities of involving all the students in the production of a whole school vision map appeared to present difficulties for the staff, so the EfS Facilitator described a method for managing this in its early stages which was similar to her suggestion for the New Entrant class; she suggested that the whole school divide into two large, mixed age groups and go on a "Ferndale walk" before working on the vision map. The EfS Facilitator went on to talk about 'a futures focus' and a process of developing steps to achieve this, i.e. looking at where they were at that point in time, and how they could get to 'X', which was seen to be an 'ideal' state of sustainable living (Meeting observation, 10/03/09). The EfS Facilitator also talked about various practical methods to help the students manage the task, e.g. use of stickers for students to attach to a vision map, 'leader statements' to prompt thoughtful suggestions from the students, and 'suggestion bubbles' for students to write thoughts in. The EfS Facilitator felt it was important to create direction for the vision map to ensure the students stayed on task and didn't just think in terms of the physical environment and making it look 'pretty' (Meeting observation, 10/03/09). The support provided by the EfS Facilitator appeared to be aimed at helping teachers to

translate knowledge, i.e. the students thoughts about their school, into action, i.e. an actual vision map created by contributions from all members of the school community.

During this early implementation phase, on March 17, 2009, the staff met together with the EfS Facilitator prior to a whole school vision map exercise to discuss the development of the vision map, the logistics of management, and the plans they had for the next time they would engage in vision map development. The EfS Facilitator assisted the staff in preparation for the ‘pre’ vision map exercise by explaining that they would need to encourage deeper, reflective thought about the school environment and encourage ‘what if?’ questions (whilst thinking more widely about the users of the school), e.g. if a student said “I like the field”, the staff could ask them “why?”, and the student might respond “because it’s a big open space” (Meeting observation, 17/03/09).

To facilitate the creation of a vision map, all the students at the school were divided into three groups of about 25 students, with each group comprised of students from all levels of the school (i.e. 5-10 - year old children) in order to discuss a PMI table (‘Positive, Negative & Improvement’ as Brianna labelled it). I observed one group, led by Brianna. Prior to this activity, Brianna had compiled a PMI table from this group and talked about it with them during my observation. The aim of the PMI table had been to collect ‘student voice’ relating to aspects of their school that they considered ‘positive’, i.e. what’s great we can (sense)?, aspects they considered ‘negative’, i.e. what’s not so great?, and what ideas the students had for improvement, with the intention of using the information to assist the creation of the school vision map.

Table 6.1 below presents the results of Ferndale School’s PMI task.

Table 6.1 *Ferndale School Vision PMI Student Response Themes for School Vision Map March 2009*

| What's great that we can see? POSITIVE | What's not so great? NEGATIVE | What ideas for improvement? |
|--|--|--|
| Gardens and trees. A clean school. Children. | Weeds. Rubbish. Messy places such as student desks and shoe corners. Concrete. | Clean up the messy places. Pull up the weeds. Plant a garden. Help the native bush. Recycling. Pick up rubbish. |
| What's great that we can do? POSITIVE | Is anything unsafe or unpleasant? NEGATIVE | What ideas for improvement? |
| Pick up rubbish. T-Ball, art, marbles (play games on the playground) Help the trees. Plant trees. Play nicely. Playing in the bush. | Trees. (Dangerous play) Jumping off monkey bars etc... Running around swimming pool. Concrete. Sticks. Climbing trees. Holes in the ground. | No climbing trees. No dangerous play (e.g. stop climbing things you shouldn't be climbing). Walk around the swimming pool. Fill in the holes in the ground. Student mediators to stop students doing dangerous things. |
| What's great that we can hear and feel? POSITIVE | What's not so good that we can hear and feel? NEGATIVE | What ideas for improvement? |
| Birds chirping. Students helping each other. | Screaming students. Trucks and cars passing by. Bad language. Students hurting each other. | Tell the council to make a rule to make traffic slow down past schools. Say stop if someone hurts you. Block your ears. Ignore the noise. |

The student responses at this stage during the implementation of the whole school approach to EfS seemed to indicate attitudes and values that were mainly related to the 'Place' aspect of a whole school approach to EfS, for example, concern for the appearance of their school environment (e.g. 'rubbish' and 'weeds'), some basic thoughts about nature (e.g. planting/caring for trees), and concern for noise around their school (e.g. noisy cars, trucks and students). These responses seem to indicate that students were primarily influenced by what they saw around them and how 'clean and tidy' the physical space was. It may be that the students were influenced by the relative importance of cleanliness and tidiness in their everyday lives (e.g. through school and home life) (Erturk-Kara, Aydos & Aydin, 2015), which in turn may have created the desire for the physical environment to be clean and tidy also. This notion of 'cleaning up the environment' is also a key theme of environmental education in its 'traditional' forms, whereby people were encouraged to clean up litter and remove weeds from their living/learning space. However, it is recognised that ecosystems are made up of complex networks between living and non-living components (Begon, Harper and Townsend, 1990), are very different from "landscaped areas designed for adults, many of whom prefer manicured lawns and tidy, neat, orderly, uncluttered landscapes" (Louv, 2006, p. 256) and are not 'tidy'.

The vision map exercise also appeared to provide an opportunity for students to express their attitudes and values about student behaviour (e.g. no dangerous play or bad language) which is likely to stem from their daily school lives and reinforcement of the importance of good behaviour from the school staff. Consideration of the social and community benefits of sustainable practices in schools can be beneficial, as healthy and positive relationships can develop by students working co-operatively on environmental projects they care about (Hamilton City Council, 2001).

Brianna also discussed the concept of 'guardian' with her group. There were mixed interpretations of the term 'guardian' from the students, and included comments such as "we are the bosses", and "we are in charge". Brianna talked with the students about the things they did and didn't 'want'. During this group discussion it was apparent to me as an observer that the older students were

contributing the most, while the younger students rarely participated (Group observation, 17/03/09). The aim of this group session seemed to have been to encourage the students to think with greater depth about their school environment, with the ultimate purpose of constructing a school vision map. However, the students' expression of an intention to be 'in charge' seemed to have limited emphasis on any sense of responsibility for the environment, which is a key concept underlying EfS (MoE, 1999).

On April 2, 2009 Brianna worked with another group of 25 students comprised of individuals from each year level in the school. The EfS facilitator had provided the teachers with eight written questions aimed at encouraging deeper thought from the students prior to further work on the school vision map. Brianna provided the students with the questions on large pieces of paper and the students moved around in groups of about five or six individuals (5- 10-year olds) writing up responses. It was again observed that mainly the older students participated in this activity (Classroom observation, 02/04/09). It is possible that the older students were, unintentionally, acting as role models for the younger students with respect to learning how to think about sustainability concepts. EfS 'Programmes' recognise the role that older students can have as mentors and role models for younger students. Further participation in mixed group activities could help to develop mentoring and role-modelling skills in the older children, to the benefit of the younger students (Enviroschools, 2014). The collated responses from the students are shown in Table 6.2 below.

Table 6.2 *Student responses to questions provided by EfS facilitator in preparation for developing a school vision map.*

| Question for students | Student responses |
|---|---|
| How can you create special places for insects and birds? | Make new habitats by building new homes (e.g. bird houses, insect houses, worm farms). Give them food/water. |
| Where can people go if they feel lonely, angry, anxious, bored? | Maybe under the oak tree. On the back field. Walk around the school. Play in the sandpit. |
| Who uses our school and why? | (Teacher responses modelled to students) Students – to play and learn. Teachers – to learn and teach. Families – on the weekend or after school. The community – gala days, fun run, pool area. |
| Whose job is it to care for the school? | Student’s job. Rubbish people. Teachers. Board of Trustees. Neighbours. Community. Whole school. |
| How would you like to remember the school after you leave? | Take a certificate with you. Take pictures. Look back at your work you did at Ferndale school. Make a scrapbook. Your class can make something for you to remember. |

...continued

Table 6.2 *continued*

| | |
|---|--|
| <p>What do we want to be able to DO in the school?</p> | <p>When raining, watch a DVD. Go to the library. Sports activities. Go to camp. Woodcraft. More art. Do more work.</p> |
| <p>Does your school reflect the culture of the people in your school?</p> | <p>(written by a teacher) No - we could have art from different cultures in our school. People only use greetings in English. Words and signs are only in English. We sing the National Anthem in Maori. We welcome all people in a friendly way. Teachers treat children equally and kindly.</p> |
| <p>Why do we need schools? What things happen at our school?</p> | <p>(written by a teacher) To learn. (written by students) Country life day. Fun run, athletics, swimming. Go to camp. We play. People fight at school. To grow up and have a good job. To learn lots of stuff (times tables). Book week.</p> |

These questions appeared to prompt the students to think with more reflection about their environment. Students seemed aware that caring for the school was the responsibility of the whole community, which is one of the aspects of ‘People (& Participation)’ (Enviroschools, 2014). Overall, the responses seem to indicate the limited influence of students’ previous experiences at school, and possibly at home. For example, at this stage the student thinking with respect to caring for animals such as birds and insects appeared to be influenced by experiences in

caring for domestic animals such as pets where people provide ‘man-made’ houses and living spaces. Responses appeared to be primarily based around what they already were doing, i.e. school related work and activities such as going to camp. As EfS was still very new to the school at this stage, it is perhaps to be expected that the students responded as they did, as they had possibly not had many, if any, learning experiences in, about or for the environment from which to draw different conclusions (MoE, 1999).

After this session Brianna asked the students why they thought they were doing the activities relating to sustainability. The students appeared to be unsure of why they were doing this and did not respond. Brianna attempted to prompt the students towards greater reflection by talking to the students about previous attempts to reduce rubbish in the school and asked the students why they thought these previous attempts weren’t sustained over time (e.g. past attempts to have a rubbish-free school by doing things such as blocking rubbish bins). The students did not seem to be clear in their responses to the questions. As a part of this group discussion, students were asked about what they thought they could work on to improve in their environment. The teacher led the discussion towards having a ‘calm’ garden and some students suggested possible physical attributes that this garden could have, like mosaics that they said they had seen at other schools they had visited. A student suggested creating a room for students to practice music in. The teacher responded to this idea and led the discussion towards the possibility of having musical elements in their ‘calm’ garden. The students appeared more engaged at this time during the discussion, possibly because they were being scaffolded by their teacher through a discussion topic they felt more confident with. This was followed by reading a story to the students called *Who is the world for?* (Pow & Ingpen, 2001) which was apparently intended to encourage the students to think more deeply about their environment.

After the group work with the students, the EfS Facilitator met with all the staff who had been involved in the discussion work described in the above paragraphs. The principal verbally summarised what previous groups had started on for their own vision maps, and there was discussion about what they described as ‘frivolous’ points brought up by students. The EfS Facilitator led discussion

about getting students to put up signs about behaviour and care for areas in an attempt to encourage greater depth of thought (Meeting observation, 02/04/09).

During the process of preparing a vision map in this early implementation phase, students started to explore their attitudes and values with respect to their school environment. The depth of the student thinking with respect to their attitudes and values about their environment seemed to be either enabled by the presence or inhibited by the absence of appropriate scaffolding provided by the teacher. The ability of the teacher to scaffold the students in their thought processes and responses may in turn have been enabled or inhibited by their own depth of understanding of EfS. The students' thinking also appeared to be influenced by experiences in their own lives, which, during this implementation phase seemed to consist of very few, if any, experiences relating to sustainability. The assistance of the EfS Facilitator, in providing questions which could help the students to develop their attitudes and values with respect to their school environment during this early implementation phase, could be considered to be an enabler in the whole school approach, as appeared to be shown by the greater variety of responses produced by the students in Table 6.2.

6.3.7 'Programmes' Summary

Meetings during the early implementation phase of the whole school approach to EfS led the EfS Facilitator to emphasise the transdisciplinary nature of EfS. Findings show that in this early implementation stage, some staff saw teaching EfS as a separate 'subject' or topic. This may act as an inhibitor in the development of a whole school approach to EfS.

The EfS Facilitator visited each of the classrooms and spent some time modelling to the teachers different styles of discussion that appeared to be aimed at helping the students to think more deeply about their environment, which is in accordance with the 'programmes' aspect of a whole school approach to EfS where the teacher role becomes one of facilitating learning and inquiry (Enviroschools, 2014). She also appeared to be encouraging the students to think about personal and social responsibility for action, which is one of the key concepts underlying

EfS, as described by the *Guidelines for Environmental Education in New Zealand schools* (Ministry of Education, 1999). Such professional learning experiences are enablers in the development of a whole school approach to EfS.

The EfS Facilitator emphasised student-centered learning approaches during the implementation of the whole school approach to EfS which recommended by Enviroshools (Enviroschools, 2014) in order to help students gain competencies by initiating their own learning. This type of learning approach could be considered an enabler to the development of a whole school approach to EfS.

During the early implementation stage the school's EfS programme appeared to be focusing on building student knowledge and understanding, which is one of the key aims of EfS (MoE, 1999) and could assist in enabling the implementation of the whole school approach. Knowing about and understanding the natural and built environments and the holistic nature of EfS is also one of the key dimensions of EfS, (i.e. education *about* the environment). Knowledge about the environment can contribute to helping students establish their own environmental attitudes and values (MoE, 1999). Indications of education *in* the environment and education *for* the environment were not yet apparent during this early implementation stage.

During the process of preparing the vision map in this early implementation phase, students started to explore their attitudes and values with respect to their school environment. The depth of the student thinking with respect to their attitudes and values about their environment seemed to be either enabled by the presence or inhibited by the absence of appropriate scaffolding provided by the teacher. The ability of the teacher to scaffold the students in their thought processes and responses may in turn have been enabled or inhibited by their own depth of understanding of EfS. The students' thinking also appeared to be influenced by experiences in their own lives, which seemed to consist of very few, if any, experiences relating to sustainability. The assistance of the EfS Facilitator, in providing the staff with questions which could help the students develop their attitudes and values with respect to their school environment, could be considered to be an enabler in the whole school approach.

6.4 Practices

School 'Practices' form one of the four key areas of schooling life that may have an effect on planning for sustainability and student learning in a whole school approach (Enviroschools, 2014). These practices include the policies and systems that are in place within the school.

During the implementation phase of the whole school approach, themes relating to sustainable practices were only touched on briefly. During a meeting with staff, the EfS Facilitator suggested involving the students in a school-wide research project, such as monitoring waste management processes, and then students could present their findings to the school at assemblies and produce a community report in the school newsletter. She had suggested that a school envirogroup could be a key part of this. In response to this Ally had said that she did not want to do this until the students decided that was what they wanted to do (Meeting observation, 10/03/09). She also pointed out that, as a school, they could not do everything with 'group consultation', some things (she did not specify what) they just needed to 'get on with' (Meeting observation, 27/05/09).

Monitoring sustainable practices within the school is an important factor within the 'Practices' aspect of a whole school approach, and, if undertaken could act as an enabler in the implementation of the whole school approach. Making decisions with, or driven by the students is also a key aspect of 'People', and could also act as an enabler in the implementation of the whole school approach.

6.5 Place

Aspects of 'Place' did not feature greatly in the implementation of the whole school approach to EfS. The primary theme that emerged was the observation that students were becoming involved in teacher-led discussions asking them what they could 'work on' to 'improve' in their external school environment. One teacher, Brianna, was observed to lead a discussion with her class towards the idea of developing a 'calm garden' in the school grounds, generating suggestions from the students about observations of gardens they had seen in schools they

may have previously attended, and ideas apparently of their own, that included ideas like mosaics and musical elements (Classroom observation, 24/04/09).

Another teacher, Jessica, related how her class had been involved in designing possibilities for a new garden at the school (independently to the class mentioned above). Although it seemed that the final design would, at that stage, be in the hands of a visiting landscape designer, who had come to visit the students one morning to talk to them about the practicalities of producing a garden in the small space that they had available to them (Jessica, semi-structured interview, July, 2009).

Ally had also brought up the point that students had emailed the local council about the apparent problem caused by overgrown grass on the outskirts of the school because their balls kept getting lost in it. (Meeting observation, 02/04/09). This may have indicated that the students considered the spaces immediately outside their boundary as not being their responsibility

These tasks and discussions seemed to indicate that the school was in the early stages of recognising that the grounds were a learning resource for student action where students can design and re-create their places, a key aspect of 'Place' (Enviroschools, 2014). Thus, these tasks could be considered enablers in the implementation of the whole school approach. However, it appeared, during this implementation phase, that each class was working in isolation from each other with respect to garden designs and aspects of the school that they liked and did not like. This could be considered an inhibiting factor in the implementation of the whole school approach, as it was not obviously involving the *whole* school in a united vision, which is considered an important aspect of a whole school approach to EfS (Enviroschools, 2014).

6.6 Chapter Summary

This Chapter has provided an outline of the themes that emerged in terms of 'people, programmes, practices and place' during the implementation phase of the school's development of a whole school approach to EfS. It also highlighted

factors that may act as enablers or inhibitors in the implementation EfS across the school (See Table 6.3).

Table 6.3 *Enablers and inhibitors to the whole school approach during the implementation phase*

| EfS Enablers | EfS Inhibitors |
|---|---|
| Facilitator modelling EfS in practice. Student-centred learning approaches. Students participating in monitoring sustainable practices in school. A rudimentary understanding of the nature of ‘People (and Participation)’ ‘Programmes’, ‘Practices’ and ‘Place’. | Limited staff understanding of the depth and breadth of the concept of sustainability and EfS. A lack of staff (including principal) prioritisation of EfS, in part indicated by lack of consistent full staff attendance at all EfS Facilitator led sessions. |
| Developing students’ knowledge and understanding, and attitudes and values around sustainability. | Teachers providing limited scaffolding to support and develop student knowledge around sustainability. Teachers view EfS as a separate ‘topic’ to be studied. Whole school not involved in EfS. |

The EfS Facilitator appeared to be acting as an enabler in the implementation of the whole school approach to EfS by modelling to the teachers’ ways in which they could connect with the students and develop their reflective thinking skills around EfS.

During the early implementation phase, teachers were asked how they thought their students had responded to the EfS tasks that they had participated in. It seemed that the younger students (Year 2 and Year 3) were struggling to participate in EfS discussions, possibly because of their young age and limited knowledge and understanding. The older students (Year 3, Year 4, Year 5 and Year 6) appeared to be showing positive responses to their EfS work. It was possible that the younger students may have benefited from EfS tasks and discussion questions more specifically tailored to their age and level of knowledge

and understanding. Knowledge and understanding is an aim of EfS which appeared to be a focus during the implementation of the whole school approach (MoE, 1999) and may students' abilities to be active participants in group discussions relating to EfS (Enviroschools, 2014).

Developing staff cohesion, ownership and direction had been proving difficult at Ferndale school because the professional development with the EfS Facilitator did not appear to be an essential part of the school systems and was not consistently being done with all the staff at the same time. Developing a sense of ownership is a key aspect of 'People' within a whole school approach to EfS (Enviroschools, 2014) and appeared to be only emergent at this stage (Eames, Wilson-Hill & Barker, 2013). Professional learning experiences in EfS need to be given priority in school systems if they are to act as enablers in a whole school approach.

Individual teachers possessed different levels of understanding relating to EfS which influenced how they perceived the EfS tasks that the students were participating in. Comments from the principal indicated that whole school participation (Enviroschools, 2014), was not being fully practised at that stage.

For some teachers, ideas seemed to have developed beyond initial thoughts which which were based around cleanliness and tidiness of the physical environment, towards teaching and facilitating skills that would help enable EfS within the school. For others, ideas surrounding EFS had remained similar since the beginning of the year. Developing students' skills, knowledge and understanding with respect to EfS was an important theme for the teachers. Skills relating to identifying, investigating and problem solving are recognised as one of the key aims of EFS (MoE, 1999) and did not feature greatly at this stage.

Meetings during the early implementation phase of the whole school approach to EfS led the EfS Facilitator to emphasise the importance of the transdisciplinary nature of EfS. Findings show that in this early implementation stage, some staff saw teaching EfS as a separate 'subject' or topic. This may act as an inhibitor in the development of a whole school approach to EfS as it does not recognise its holistic nature (Tilbury, 1995).

The EfS Facilitator spent some time modelling to the teachers different styles of discussion that appeared to be aimed at helping the students to think more deeply about their environment, which is in accordance with the ‘programmes’ aspect of a whole school approach to EfS where the teacher role becomes one of facilitating learning and inquiry (Enviroschools, 2014). The visits from the EfS Facilitator may have also been encouraging the students to start to think about personal and social responsibility for action, which is one of the key concepts underlying EfS, as described by the *Guidelines for Environmental Education in New Zealand schools* (MoE, 1999).

The EfS Facilitator talked about how the teachers could encourage student-centred learning approaches during the implementation of the whole school approach to EfS. This is recommended by Enviroschools (Enviroschools, 2014) in order to help students gain competencies by initiating their own learning. This type of learning approach could be considered an enabler to the development of a whole school approach to EfS.

During the early implementation stage the school’s EfS programme appeared to be focusing on building student knowledge and understanding which is one of the key aims of EfS (MoE, 1999) and could assist in enabling the implementation of the whole school approach. Knowing about and understanding the natural and built environments and the holistic nature of EfS is also one of the key dimensions of Education for Sustainability, (i.e. education *about* the environment). Knowledge about the environment can contribute to helping students establish their own environmental attitudes and values (MoE, 1999). Indications of education *in* the environment and education *for* the environment were not yet apparent during this early implementation stage.

During the implementation phase, the students started to explore their attitudes and values with respect to their school environment. The depth of the student thinking with respect to their attitudes and values about their environment seemed to be either enabled by the presence or inhibited by the absence of appropriate scaffolding provided by the teacher. The ability of the teacher to scaffold the students in their thought processes and responses may in turn have been enabled or inhibited by their own depth of understanding of EfS. The students’ thinking

also appeared to be influenced by experiences in their own lives, which seemed to consist of very few, if any, experiences relating to sustainability. The assistance of the EfS Facilitator, in providing the staff with questions which could help the students develop their attitudes and values with respect to their school environment, could be considered to be an enabler in the whole school approach.

Monitoring sustainable practices within the school emerged briefly during the early implementation phase of the whole school approach and is an important factor within the 'Practices' aspect of a whole school approach. If these practices were undertaken they could act as an enabler in the implementation of the whole school approach. Making decisions with, or driven by the students is also a key aspect of 'People', and could also act as an enabler in the implementation of the whole school approach (Enviroschools, 2014).

The students were engaged in teacher-led tasks and discussions that seemed to indicate that the school was in the early stages of recognising that the grounds were a learning resource for student action where students can design and re-create their places, a key aspect of 'Place' (Enviroschools, 2014). These tasks could be considered enablers in the implementation of the whole school approach. However, it appeared, during this implementation phase, that each class was working in isolation from each other with respect to garden designs and aspects of the school that they liked and did not like. This could be considered an inhibiting factor in the implementation of the whole school approach, as it was not obviously involving the *whole* school in a united vision, which is considered an important aspect of a whole school approach to EfS (Enviroschools, 2014).

The next chapter looks at the themes that emerge in terms of 'people, programmes, practices and place' during the outcomes phase of the development of the whole school approach to EfS. Possible enablers and inhibitors to the process are also identified.

Chapter 7

Outcomes of a whole school approach to education for sustainability

7.1 Chapter outline

The data presented in Chapters 5 to 7 describes the planning, implementation and subsequent outcomes of the development of a whole school approach to education for sustainability (EfS) in a rural primary school during its first year. The data presented in Chapter 7 is drawn from observations of meetings with the teaching staff and the EfS Facilitator, individual staff questionnaires, student semi-structure interviews and student book work from the latter part of the year, after EfS had been in the process of integration for at least seven months. Although the integration of EfS into the school did not occur in a linear fashion, and the planning, implementation and outcomes phases were not mutually exclusive, (i.e. there was no strictly defined and separate planning, implementation and outcomes phase, the development occurred in more of a ‘cyclical’ form with the staff continually reflecting on the daily/weekly outcomes and using this to refine the future approach) the last three or four months of the first year of EFS integration were considered a reasonable, if arbitrary, point at which one could consider what the outcomes of the whole school approach were so far. Each data chapter is subdivided into four key areas of school life that may have an effect on student learning in EfS: (1) Programmes; (2) People and Participation; (3) Practices; and (4) Place (Enviroschools, 2014).

7.2 People (and Participation)

People (and their participation) are an important aspect of a whole school approach to EfS. Data to examine the outcomes of the whole school approach was gathered from student focus group interviews, individual teacher questionnaires and a semi-structured interview with the EfS facilitator. The themes relating to ‘People’ that emerged included: student understanding of the

school vision map; students' thoughts on whose 'job' it was to look after the environment; student involvement in school decision-making processes; and the EfS Facilitator's views on school leadership and its influence on EfS.

7.2.1 Student understanding of the school vision map

In November 2009, Year 5 and Year 6 students were arranged into groups of two or three students by their teacher, for semi-structured interviews. The focus group interviews were held in their classroom (when the rest of the class was absent) in order for some discussion to take place around the school vision map which their class had created and was attached to their classroom wall. The interviews were held towards the end of the school year, after almost a year of integrating EfS into the school, in order to address what, if any, student outcomes in terms of EfS understanding there may have been.

When asked what they thought their school vision map was about, and to describe it, the students said that it showed "what we like about the school and what we don't like about it. So the blue faces are what we don't like about it and the yellow ones are what we like about it" (Jason, semi-structured group interview, November 2009). Additional students responded that "It's like we just had that map and we each took a picture of a place that we don't like and we do like, and the black and white ones are what we don't like" (Tarryn, semi-structured group interview, November 2009). Another student said that "we were in groups of two. . .and then. . .we picked a photo and then we wrote why we liked it and then why we didn't like it. . .another area, why we didn't like it. . ." (Rachael, semi-structured group interview, November 2009).

Table 7.1 summarises student responses on their school vision map regarding areas of their school that they did not like, and areas they did like.

Table 7.1 *Year 5 and Year 6 student response themes on their school vision map.*

| Areas of the school that students did not like | |
|--|-------------------------------|
| Themes | Frequency in student comments |
| Ugly | 2 |
| Dirty | 4 |
| Inconvenient/uncomfortable | 8 |
| Old | 3 |
| Broken | 1 |
| Messy | 4 |

| Areas of the school that students did like | |
|--|-------------------------------|
| Themes | Frequency in student comments |
| Fun | 8 |
| Quiet | 8 |
| Nature | 3 |
| Attractive area | 2 |
| Large, open space | 1 |

It appeared from these responses that students did not seem to like areas at their school that were considered ‘ugly’ or ‘dirty’ in appearance, or things which were considered an ‘inconvenience’ or ‘uncomfortable’ to them, for example, trees that dropped twigs on them. Additional themes that emerged as negative places for the students at the school included places that were considered ‘old’, ‘messy’ or ‘broken’. It is likely that the students were influenced by aspects of their everyday lives in their classes and home lives where hygiene and tidiness are often valued. Some examples of student comments regarding areas of their school that they did not like include:

- “I chose the [drinking] taps because Ferndale has had these taps for years and years. The taps are dirty too.”

- “I chose the oak tree because of all the sticks falling on us when we sit down. I want to see more tables and chairs.”
- “I chose this place because it is messy and dirty and does not look good. I would want this place to be changed to a grassy, shady place (area at the back of a classroom).”

Themes that emerged around areas of the school that the students did like included quiet places, areas that were fun (including places you could play sport), natural places, attractive areas and big open spaces. Some examples of student comments relating to parts of the school that they did like include:

- “I like this area because it is nice and quiet and you can hear the trees rattling (patch of trees behind some classrooms).”
- “This is my favourite place because it has all the native things like birds and trees.”
- “I like this area because it’s a fun place to play sports on (tar seal playground).”

When further prompted to explain what they thought the actual purpose of the vision map was, and what was going to happen now that it was apparently ‘finished’, students gave several different explanations. One student, Tayla, initially said that they were going to do whatever their teacher told them to do. Upon further prompting, she seemed to think that the purpose of the vision map was “to help the environment. . . to improve. . . look [at] what’s bad and good and so we’ve got to fix it up”, (Tayla, semi-structured group interview, November 2009). Molly thought that they [the students] should go around the school and start doing all the ‘simple things’, like moving piles of bamboo that appeared to be on the school grounds, and then, if they had time, move on to the bigger projects (Molly, semi-structured group interview, November 2009). Tayla and Molly both appeared to be demonstrating an understanding that actions for sustainability are desirable, in particular, that parts of the school environment seemed to need ‘fixing’, but were also seeking more direction from their teacher. Christie said that “I’d like to change the whole thing to a better, safer, beautiful

place, like Rainbows End! [a popular theme park nearby]" (Christie, semi-structured group interview, November 2009), and Katherine added, "Roller coasters!", with a laugh (Katherine, semi-structured group interview, November 2009). Christie seemed to be primarily concerned with aesthetics and safety. Rachael said that she had 'no idea' what she thought they were going to do now that they had 'finished' it (Rachael, semi-structured interview, November 2009). Kylie further elaborated: "We didn't get told this. . .what we were going to do with [it]. . .we just had to make a vision map in groups. . .and we had to figure out. . .we took a photo. . ." (Kylie, semi-structured group interview, November 2009). Katherine, Rachael and Kylie seemed to indicate a need for direction regarding the purpose of their vision map. It appeared that for some students there was no perception of collaboration across the school with respect to the vision map, i.e. the students apparently were 'told' to collect data about the school's current environment but there appeared to be no further collaborative action planned from there. Another student, Regan, said that he was hoping that the teachers would have a look at the map and see what they need to improve (Regan, semi-structured group interview, November 2009). Regan indicated an understanding of the importance of collaborative working relationships by saying that he thought that 'they' were going to see what the students thought about it and if they agreed [on what to work on at the school], and that the parents could come and have a look at what they like (Regan, semi-structured group interview, November 2009).

When asked about how they thought the vision map related to the sustainability tasks they had been involved in during the year, Christie gave the following reply: "oh yeah, education for sustainability, we have to make things, like, 'cause, well over there we're making a path or something in the bush, and we have to make it sustainable. . .yeah" (Christie, semi-structured group interview, November 2009). Tayla responded: "sustainable. . .and we're doing a peace garden and we like want it to sustain. . ." (Tayla, semi-structured group interview, November 2009). The comments from the students indicated that they seemed to be struggling to link the concept of sustainability with the vision map.

These responses from the Year 5 and Year 6 students seemed to indicate some understanding of the purpose of creating a school vision map, i.e. to identify aspects of the school that they liked and didn't like. There appeared to be a general feeling of uncertainty about the ultimate purpose of the vision map, with some students saying they did not know what they were going to do with the map now that it was 'finished'. However, there were a few students who appeared to demonstrate an understanding that actions for sustainability were desirable and that it was important to collaborate across the school when 'improving' it. The students appeared to be unsure of the vision map connected to any EfS tasks they had been involved in during the year. It also appeared that, from the perspective of the researcher, that although the entire school had been involved in the groundwork for a school vision map, i.e. creating 'PMI' tables (see previous chapter), the vision map that was being discussed during these semi-structured interviews only involved the students from this particular class, i.e. that it was not a collaborative project across the school and its community. EnviroSchools (2014) recommends that the whole school and its community be involved in the development of the vision map. Thus the task may not have been as 'enabling' in the whole school approach to EfS as it might have been if had involved all students and been viewed as a working document. Instead, the vision map appeared to be a static display on a classroom wall at that time.

7. 2. 2 Student thoughts on whose 'job' it was to look after the environment

Students were asked in small focus groups whose 'job' they thought it was to look after the school environment. Tayla, Christie and Kelly said:

Everyone together: Ours...and the teachers...everybody! Yourself and everybody.

Interviewer: OK, why?

Christie: To keep yourself safe.

Tayla: To keep yourself safe and (unintelligible) native birds.

Kelly: Because if you...you can't like make it someone else's job because if no-one cares for it then it's left to other people...

Christie: To care for our environment and to attract for native birds, like kereru... (general talk about pinecones filled with bird food and hung on trees) we put like, these, er, pinecones with pop-corn in them and hung them on the trees.

Tayla: And we got little bird houses made out of bottles... (general talk about popcorn in pinecones)

Interviewer: And are they using them?

Christie: Yeah.

Kelly: Most of the birds have been eating it.

(Tayla, Christie & Kelly, semi-structured group interview, November 2009)

Janine, Daniel and Tara were then asked whose job they thought it might be to look after the school environment and why:

Tara: The students.

Interviewer: So why do you think it's the students' job to look after the school environment?

Daniel: I reckon it's really anyone who enters the school.

Interviewer: OK, and why? Is it because they're on the school grounds and they're responsible for where they are?

Daniel: Yeah, they're entering the school.

Janine: I think, like, the whole community should look after it by not coming over here and vandalising it...and the teachers should make sure the kids are looking after it, like I think that the mediators' job also to be like go around and check that nobody's vandalising the school.

(Janine, Daniel and Tara, semi-structured group interview, November 2009)

When asked whose job it was to look after the environment, Reece and Henry replied:

Together: Ours...Everyone's...

Interviewer: OK, and why?

Henry: Because there's only...like, there are quite a lot of people doing it, but there are probably more people not looking after the environment than

there are...looking after it, and if we...if everyone in the whole world looked after the environment the world would be a lot of a better place...and all the animals that were extinct wouldn't have been extinct if we did it...

Reece: He's on a scientific (*unintelligible*) today...

Interviewer: Ok that's great. So what do you think? (to Reece) Same reasons or different reasons or...??

Reece: Well, I think everyone should, because, I mean, even every little bit helps the environment to survive.

(Reece and Henry, semi-structured group interview, November 2009)

When asked whose job did they think it was to look after the environment, both Kylie and Molly said that it was 'everyone's', and Molly said that it was because they didn't 'want to have a waste dump' (Kylie and Molly, semi-structured group interview, November 2009).

When asked whose job they thought it was to look after the environment, both Jason and Regan said that it was "everyone's" job. When asked why they thought this, they said:

Jason: Because the school isn't really private, like, whoever comes into the school grounds has to look after it.

Regan: It's owned by the government, so if you vandalise it you could get a fine. . .heaps of people vandalise it...and still...but we know who they are, but...no one even speaks up about whose doing it...

(Regan and Jason, semi-structured group interview, November 2009)

All the student responses indicated that they felt it was everyone's job to look after the environment. This could suggest that they considered it important for all people in their community to participate in caring for their environment, which is a key aspect of 'People' as described by the EnviroSchools Programme (EnviroSchools, 2014).

7.2.3 Student involvement in school decision-making processes

Approximately a year after these student focus groups were held, a staff focus group provided written responses to several EfS-related questions. The staff mentioned that the students had been actively involved in the school planning by having an opportunity to put forward their ideas for the remodelling of the 2 junior rooms and continued to have leadership opportunities in all school areas (Staff focus group, September 2010). This is in alignment with the ‘People’ aspect of EnviroSchools where students are encouraged to be involved in decision-making processes within the school. (EnviroSchools, 2014).

7.2.4 EfS Facilitator views on school leadership and its influence on EFS

In December 2009 a semi-structured interview was held with the EfS Facilitator to reflect on her views about the progress the school had made in implementing EfS during that year. Prior to starting the interview I asked her to review the questions that I had given her during the planning phase of the school’s journey into EfS and re-read the answers that she had given me then. I then explained that I wanted to discuss to what extent her original aims and outcomes, as described at the beginning of the year, were being demonstrated by the school.

The first question sought the EfS Facilitator’s thoughts on the plans she had had for the helping the school in terms of education for sustainability, and whether she felt that the school had demonstrated outcomes that followed on from her original ideas. She replied:

It’s the same as at the beginning of the year, where it is to get EfS embedded, but I think they sort of thought it was going to happen quite quickly and easily, and that’s the route I think the principal has taken... and... you’re not going to get it embedded if you go too quickly... you’ve actually got to do it in stages.

(Semi-structured interview, Beth, December 2009)

She was further asked what she would like to have seen happen at the school in terms of sustainability. She felt that:

I think the people, the people that we have basically dealt with being the staff and the students, really very genuinely believe, or want, their school to be sustainable, and I think they've got this desire for it to be... um... the community, the parents, the BoT... the whole works... and I think the BoT may be a stumbling block at the moment, and that's probably the make-up of the community... um... because I suppose the socioeconomic range of the community that they don't see, because they don't understand that EfS is important...

(Semi-structured interview, Beth, December 2009)

The EfS Facilitator also commented that:

I think they're seeing funding as a stumbling block, whereas I don't... sure when you do things there are certain things that require funding... but... you know, that's not what it's all about... if it's sustainability then it's about looking at other options... and looking at sustainable options...um...but I really think that lack of funding has been in the back of their minds the whole time... so I mean, and that's where, if you really want the students to be embedded, where you go back to them and say, look, these are our plans and this is what we thought we'd do, because of the funding available, we haven't [got it], so let's look for an alternative.

(Semi-structured interview, Beth, December 2009)

These quotes indicated that while the staff appeared to see the importance of collaborative working relationships in EfS (Enviroschools, 2014), they were struggling with the implementation due to perceived inhibitors such as lack of funds.

Additionally, in response to the question about progress in sustainability at the school, the EfS Facilitator felt that, although the principal had “her heart in the right place”, she had not helped the staff to take any ownership of the integration of EfS into the school. The EfS Facilitator considered that Brianna was the teacher who exhibited most understanding of EfS at that time and who had EfS “right in her heart”, but that “she got frustrated at times” by her inability to make progress. The EfS Facilitator also thought that the other staff, i.e. Jessica, Sarah, and Jane (the New Entrant teacher who did not participate in the study) had needed more opportunity to develop a greater understanding of EfS, and that the general

attitude of the staff was that the junior students “were only little and they couldn’t do anything”. The EfS Facilitator felt that the junior students were the ones that ‘get it into their hearts straight away. . . they can do all sorts of things. . .they’re the ones that really suggest all the gorgeous little things” (Semi-structured interview, Beth, December 2009).

When asked how she thought Ferndale school compared to other schools she had worked with when they had been at a similar stage in their EfS journey, the EfS Facilitator said that she thought the biggest factor was leadership “from the top. . .the principal” and that:

They [the principal] set, to a large degree... they set the scene... and they’re the ones who are supportive... I think that’s probably the easiest way to answer it, that I just really think that it’s proven how important that principal is in setting that tone... and again, it’s those schools that have really got it embedded after ten years, I would say, and the ones that I know, the principal has been a really key factor, not in leading the school in EfS, but in the support and the management and allowing the key teacher to get a little bit more understanding initially... and I think it’s that same thing... if that same opportunity had been given then Ferndale may be in a different... they might... in some ways they wouldn’t be as far ahead, but in other ways they’d be a lot further ahead because it’d be... um... I’m sure it would be embedded more.

(Semi-structured interview, Beth, December 2009)

The EFS Facilitator had also commented that good leadership in EfS required a “deep understanding of sustainability” and critical reflection (Beth, Semi-structured interview, December 2009). In her experience, she seemed to feel that principals’ responses often revolved around “what she would *like* to see happen, or knows what maybe *should* happen, rather than the practicalities of what *is* happening” (Semi-structured interview, Beth, December 2009).

The influence of the principal on a school’s EfS journey was a frequent theme for the EfS Facilitator. In particular, this included the role of the principal in the provision of support with respect to (a) the development of collaborative working relationships across the school; and (b) supporting the involvement of staff in professional development with respect to EfS. It could be said that, in terms of

‘outcomes’, the levels of both development of collaborative work across the school, and engaging staff in professional development were somewhere between preparatory and emerging.

7.2.5 ‘People (and Participation)’ summary

The responses from the Year 5 and Year 6 students indicated there were mixed opinions about the ultimate purpose of the vision map: a few students appeared to demonstrate an understanding that actions for sustainability were desirable and that it was important to collaborate across the school when ‘improving’ it; whereas others seemed to be unsure of what they were expected to do after the map was ‘finished’. The students appeared to be unsure of how the vision map connected to any EfS tasks they had been involved in during the year. It also appeared that the vision map was not a collaborative project across the school and its community as recommended by the Enviroschools Programme (Enviroschools, 2014). The vision map task may have been more enabling if it had involved all students and been viewed as a working document.

Students indicated that they thought it was ‘everyone’s job to look after the environment. This could suggest that they considered it important for all people in their community to participate in caring for their environment, which is an important aspect of ‘People (and Participation)’ (Enviroschools, 2014), and an enabling factor of a whole school approach to EfS.

Data collected approximately two years after the school’s EfS journey began indicated that students had some involvement with school decision-making, which can be considered an enabler in the process of developing a whole school approach to EfS.

The influence of the principal on a Ferndale school’s EfS journey was a frequent theme for the EfS Facilitator. In particular, this included the role of the principal with respect to needing to developing greater collaborative working relationships across the school community and supporting the involvement of staff in EfS professional learning experiences. This can be considered an inhibiting factor. In

terms of ‘outcomes’, the levels of both development of collaborative work across the school, and engaging staff in professional development were starting to emerge.

7.3 Programmes

Data pertaining to possible outcomes of the whole school approach to EfS was sourced from small student focus groups (two or three students), individual written teacher-questionnaires, a semi-structured interview with the EfS Facilitator, and a staff focus group held in the following September after the school’s first year’s integration of EfS. Themes that emerged relating to outcomes of EfS programmes included: student understanding of the term sustainability; teacher understanding of EfS and the term sustainability; and teacher views on EfS teaching approaches and student outcomes; and teacher views on a whole school approach to EfS. Approximately a year after finishing the first year of EfS integration, a staff focus group was held and written responses to questions were collected.

7.3.1 Student understanding of the term ‘sustainability’

Students were asked, at the end of the first year of their whole school journey, what they understood sustainability to mean. Tayla and Christie understood that the concept of sustainability included the idea of ‘things’ lasting over time:

Tayla: Something that will stay there for a long time.

Christie: For a very long time, like this whole school.

Tayla: It will sustain...

Katherine: (no response)

(Tayla, Christie & Katherine, semi-structured group interview, November 2009)

Ideas that emerged from the discussion with Janine, Daniel and Tara included: using fewer resources; making things last over time, and recycling. A definition for sustainability had been written up on the classroom whiteboard as one student had noted:

Janine: That was written up on the board.

Interviewer: OK, so what are a few words that you can remember from what it means?

Daniel: Using fewer resources? That's all I can remember.

Interviewer: OK that's fine, anyone else...?

Janine : Like Daniel said, and it's trying to, like, make things last for a longer time... making things be sustainable, like we're trying to build that, um, peace garden out there that's, um, like, made out of material that will last.

Interviewer: OK can we think of any other words to add to that, we've got: using fewer resources, we've got making things last longer, do we all agree with that or do we think something different?

Tara: Um...recycling.

(Janine, Daniel and Tara, semi-structured group interview, November 2009)

Kylie, Molly and Rose appeared a little uncertain about the definition of sustainability when they could not find it on the classroom wall:

Kylie: um... no idea! (group laughs)

Rose: um... it's a way of ...? Mrs X rubbed it off the board! ... it's a way of life... I can't remember!

(Everyone laughs)

Molly: It's a way of life or something like that....

Interviewer: OK, to do with what...? To do with damaging the environment? To do with being careful about it?

Everyone: Careful!

Rose: (as if reciting from memory) "A way of life that uses less natural resources..."

Kylie: All I remember is something...something..."waste"!

(Kylie, Molly and Rose, semi-structured group interview, November 2009)

Upon prompting the students seemed to remember that sustainability referred to a 'way of 'life' that used 'less natural resources'.

Jason, Ravi and Regan also seemed a little hesitant in their responses, although they too seemed to recall that an element of sustainability was that ‘things last over time’:

Jason: Um... sustainability sort of means it’s sustainable... sort of like habitats.

Interviewer: Uh-huh. That’s good.

Regan: I say it’s like resources that will be there for ages and ages... and will be able to stay there... they won’t be torn down...

Ravi: Yeah.

Interviewer: OK, so you agree (to Ravi and Jason)?

Ravi and Jason: Yeah... uh-huh.

Regan: Good structures... something that will last over time...

Ravi and Jason: Yeah.

(Jason, Ravi and Regan, semi-structured group interview, November 2009)

While all students appeared to struggle with a detailed definition of sustainability, a common theme across the student responses was the idea that sustainability was ‘about things lasting a long time’. A few students mentioned that it was about ‘using fewer resources’, although there was no further discussion to establish if they understood what ‘resources’ were. Only one student mentioned recycling in relation to the meaning of sustainability. This apparently limited understanding of sustainability could act as an inhibitor in the development of a whole school approach to EfS. It appeared that the teacher had written a definition of the term sustainability on the classroom wall/whiteboard which the students were using to help prompt them. Having a definition of sustainability on the classroom wall to support students’ learning could be considered an enabler in the development of a whole school approach to EfS.

In September 2010, almost a year after the above student data was collected, the staff responded in a written focus group session that they felt that the students’ understanding of the concept of sustainability had not changed. As a group, the staff said that there had been no emphasis on sustainability in their teaching and that they hadn’t reinforced it. At the same time the staff thought that the Year 5

and Year 6 students may have internalised the concept over the year (Staff focus group, September 2010). This lack of reinforcement of sustainability by the staff during the year coincided with the absence of the EfS Facilitator in the school. The EfS Facilitator was only active in the school during the school's first year of EfS integration.

7.3.2 Teacher understanding of EfS and the term sustainability

In December 2009, short, written individual questionnaires were given to Jessica and Sarah. Jessica taught a Year 3 and Year 4 combined class, and Sarah taught a Year 4 and Year 5 combined class. These teachers were selected in order to not overwhelm the principal and lead EfS teacher, who had already participated in several interviews during the year.

Both teachers were asked to describe if and/or how their understanding of EfS had changed over the year. Jessica thought that her understanding of EfS had remained much the same, although she did think that perhaps she had some clarification about what it meant, i.e. more than environmental learning (Individual questionnaire, Jessica, December 2009). Sarah felt that her understanding of what sustainability is had been clarified and that she now felt that she had a greater understanding of what sustainability was and how it could be linked to education (Individual questionnaire, Sarah, December 2009).

Approximately a further year after finishing the first year of integrating EFS into the school, the teachers were asked if they felt that their understanding of the concept of sustainability had changed and why. The teachers responded in a focus group that their understanding had not changed because it had not been reinforced with any professional development sessions as their EFS Facilitator had been forced to stop visiting the school because of funding issues. They went on to write that no staff had attended any courses relating to EfS, and that "the impact has been on the children's idea of sustainability and in-depth group planning – less cohesive planning in terms of building on blocks in each level" (Staff focus group, September 2010).

7.3.3 Teacher views on EfS teaching approaches and student outcomes

When asked to summarise what, if any, EfS related tasks they had been involved in since July that year Jessica wrote:

We have looked at habitats in depth and what they are and how things co-exist within that habitat. Also encouraging more bird life to school as the children didn't feel we had enough. So they have had to design something to encourage birds to school, so we mainly had bird feeders and bird houses.

(Individual questionnaire, Jessica, December 2009)

Jessica described her teaching approach in these instances as “Inquiry based trying to get the children to lead their own learning but with guidance for some who were unable to get started” (Individual questionnaire, Jessica, December 2009).

Sarah described the EfS related tasks that her class had been involved in:

Students have led the process and chosen activities and their learning path which I have been more of a facilitator of rather than director. We have studied habitats of birds and insects that live around the Ferndale area, with a particular focus on native species, with the idea of learning what type of habitat they require so therefore enabling us to improve the school environment to cater for these animals. Then the students elected to eliminate the weeds around the school that were inhibiting the growth or development of our native area so this led us to producing a range of environmentally friendly (mostly) weed killer.

(Individual questionnaire, Sarah, December 2009)

The two teachers were then asked to consider, now that they were at the end of the year, how they thought that their students had responded to the whole school approach. Jessica thought that her students were a lot more interested in what they were learning because their learning was driven by their own curiosity (Individual questionnaire, Jessica, December 2009). Sarah replied that:

They have really enjoyed learning about the environment and how they affect their space and how little changes can have a huge

impact on the habitats of other species i.e. allowed to play in native bush areas saw the decrease in species spotted in there due to noise and trampling of undergrowth.

(Individual questionnaire, Sarah, December 2009)

Jessica considered that her students had changed in their understanding of the concept of sustainability over the year because apparently they were able to talk a bit more about their learning and why they were learning it (Individual questionnaire, Jessica, December 2009). Sarah said that yes she thought they were “more aware” and referred back to her answer to the above question as evidence (Individual questionnaire, Sarah, December 2009).

Approximately a year after these individual written questionnaires were collected, a staff focus group responded to similar questions and provided a written summary of their responses. When asked what, if any, EfS related activities they had taught or been involved in during that year, they replied that:

- They had co-operatively developed Whanau gardens with the children designing and planting them to represent their groups. They were now maintaining them.
- The children had together raised 2 school chickens – they were responsible for nurturing the chickens and kept a diary of their development. They then became their outdoor “chooks” and the children looked after them.
- Each class raised bean seeds for Country Life Day.

These responses indicated that student centred learning approaches were being used, i.e. aspects of ‘Programme’, as described by the Enviroschools Programme (Enviroschools, 2014).

The teachers also wrote about their teaching approaches to EfS:

- Where possible the planning had been student directed and underpinned by their “Ferndale Keepers of the School” philosophy.
- The children had been encouraged to take part in community challenges.

- A cultural group was developed to celebrate cultural diversity.
- The children had taken part in regular weeding of the Whanau Gardens, and other “caretaker” jobs.
- The children used design briefs to undertake different projects.

Again, these responses indicated that student centred learning approaches were being used within the school programmes which can be considered an enabler in the development of a whole school approach to EfS (Enviroschools, 2014).

7.3.4 Teacher views on the process of a whole school approach to EfS

The teachers were asked for their thoughts on the process of a whole school approach to EfS, and any factors that inhibit it or help it, positive/negative aspects of it and the practicalities of it as a school-wide approach. Jessica said that having a whole school approach had helped as they were able to share lots of ideas with each other and plan together. She also said that they had had Rooms 1 and 3 (Years 2, 3, and 4) working together on different tasks which has helped a lot of students to learn co-operative skills (Individual questionnaire, Jessica, December 2009). Sarah had said that they felt that the whole school approach worked with such a small school because everybody was headed in the same direction, but not necessarily on exactly the same path, and that they had a common goal (Individual questionnaire, Sarah, December 2009).

During the written staff focus group that was held approximately a year after the conclusion of the school’s first year of being involved in a whole school approach to EfS, the teachers were asked what their thoughts were on the various factors that had (or had not) been involved in enabling or inhibiting a whole school approach. They were asked to include other thoughts relating to the development of a whole school approach. In their written response they said that:

- Sustainability elements had been embedded in our idea of planning – front loading / child directed and planned where possible.
- The children were keen to keep the school tidy.

- We are following the Te Huarahi idea on Māori workshops.

It seemed that the teachers felt that they had benefited from the collaborative aspects of a whole school approach, which is an enabling factor. A year after concluding the first year of EfS integration, the staff had been working without the assistance of the EfS Facilitator which seemed to have affected their progress into the development of a whole school approach as sustainability appeared to be playing a subtle role in the schools programmes.

7.3.5 ‘Programmes’ summary

Students appeared to struggle with a detailed definition of sustainability: a common theme across the student responses was the idea that sustainability was ‘about things lasting a long time’. A few students mentioned that it was about ‘using fewer resources’ and recycling. A written definition of the term sustainability on the classroom wall/whiteboard helped prompt the students which could be considered an enabler in the development of a whole school approach to EfS. The complex nature of EfS did not appear to be well understood by the students which could be considered an inhibitor.

Almost a year after the school had finished its first year of EfS integration, the staff felt that the students’ understanding of the concept of sustainability had not changed as there had been no emphasis on sustainability in their teaching and they hadn’t reinforced it. This lack of reinforcement of sustainability by the staff during the year coincided with the absence of the EfS Facilitator in the school during that year and may have been an inhibitor in their development of a whole school approach.

Teachers’ opinions on the development of their own understanding of EfS varied: Brianna thought it had increased, while Sarah and Jessica felt that it hadn’t. The teacher who felt her knowledge had increased was also the teacher who had attended all of the professional learning sessions with the EfS Facilitator, whereas those who reported less change had spent less time with the facilitator. This may

indicate that the professional learning sessions had had an enabling effect on the teachers EfS knowledge and understanding.

Approximately a further year after finishing the first year of integrating EFS into the school, the teachers responded in a focus group that their understanding had not changed because it had not been reinforced with any professional development sessions as their EFS Facilitator had been unable to continue visiting the school because of funding issues. The lack of professional learning sessions with the Facilitator may have been an inhibiting agent in their integration of EfS into the school.

In general, the teachers felt that students, particularly those in Year 3 through to Year 6, had responded positively to the EfS teaching approaches that they had been including in the classroom. Methods of informally ‘assessing’ this included higher interest levels from the students, more ‘awareness’ of the environment, and a greater ability to talk about their learning and why they were learning it. It appeared that the EfS tasks that the students had been engaged in were enabling their interest in the environment. The staff focus group responded that, a year after finishing the first year of the whole school approach to EfS, student centred learning approaches were being used. This can be considered an enabling factor in the development of a whole school approach to EfS.

It seemed that the teachers felt that they had benefited from the collaborative aspects of a whole school approach, which is an enabling factor. A year after concluding the first year of EfS integration, the staff had been working without the assistance of the EfS Facilitator which seemed to have affected their progress into the development of a whole school approach as sustainability appeared to be playing only a background role in the school’s programmes.

7.4 Practices

EfS practices within the school include school policies that support sustainability. Sustainable practices within the school should be monitored over time. Sustainability is encouraged to be a guiding force in school budgeting and a fundamental part of staff recruitment practices.

7.4.1 EfS practices within the school

By the end of the first year of EfS integration into the school, it appeared that the aspects of 'Practices' that concerned the students most were those relating to the 'tidiness' of the school. The apparent tidiness of the school was described by the students in terms of 'litter' on the ground and the amount of 'damage' done to the school grounds. For example, during a student focus group, Janine, Daniel and Tara mentioned that some students at the school were showing care and concern for the environment, while others, possibly including people from outside the school, did not appear to 'care' about the environment and were making it 'messy' by breaking branches or breaking windows (Janine, Daniel and Tara, semi-structured group interview, November 2009).

Students Reece and Henry also indicated that there were varying levels of care and concern for the school environment amongst the students at the school, and that some students were 'littering' in the native bush area of the school and this resulted in the area being 'out of bounds' to other students (Henry & Reece, semi-structured group interview, November 2009).

A teacher focus group held approximately a year after the conclusion of the school's first year of being involved in EfS indicated that the students liked to show they were caring for the environment (Teacher focus group, September 2010). The teachers also wrote that:

- The students were keen to keep the school tidy.
- The rubbish issue has been very good – we have reduced our rubbish by half.
- Recycling has been established.
- Food scraps are now kept for feeding the chickens

It seemed that school practices relating to managing rubbish were being well maintained roughly two years after the school had started its EfS journey. This

can be considered a positive outcome in the development of the whole school approach to EfS.

It appeared that the students were enthusiastic about waste minimisation practices both towards the end of the first year of EfS integration and roughly two years after starting their whole school approach to EfS. Waste minimisation is one of the practices that a school can engage in which supports the whole school approach to EfS (Enviroschools, 2014) and may be an enabler to a whole school approach to EfS.

7.5 Place

As it has been stated in the Chapters 5 and 6, the Enviroschools Programme recognises that 'Place' is an important aspect of schooling life that can have an effect on sustainability and student learning (Enviroschools, 2014). Focus group interviews and individual semi-structured interviews provided data sources for this phase of the study which looked at some of the outcomes of the whole school approach to EfS that were interpreted as being related to 'Place'. Themes that emerged in this section included attitudes and values of care and concern for the environment and an understanding that the environment supports life.

7.5.1 Student views on their school environment

During the Year 5 and Year 6 student interviews mentioned above, students were asked what they thought about the environment at their school and why they thought the way they did. Many of the responses revolved around concepts of care and concern for the school environment, and its general appearance. Tayla thought that some bits were good and some not so good, and that lots of people didn't care about it [the environment]. (Tayla, semi-structured group interview, November 2009). Katherine thought that some people treated the school environment well, and others treated it not so well (Katherine, semi-structured group interview, November 2009). When asked what they thought would 'make' them [the other students] care, the following conversation took place:

Tayla: “Um I don’t know, maybe you could explain it to them really meaningfully, like say what could actually happen, like if they...”

Christie: “But they don’t care...”

Katherine: “They could get run over on the road if they’re not looking...”

Christie: “They just block their ears and ignore you...”

Tayla: “But if you actually say to them what could happen if you don’t care for the environment, what could happen, then they might start thinking about it.”

(Tayla, Christie & Katherine, semi-structured group interview, November 2009)

This discussion indicates that Tayla, Christie and Katherine thought that other students could develop concern for the environment if they had an understanding of the consequences of their actions relating to EfS.

The following conversation occurred when Janine, Daniel and Tara were asked how they felt about the school environment and why:

Janine: Um... well some people treat it really badly, like the people who smash the windows...

Daniel: The vandalising people.

Tara: Um...angry because... they... they... break the branches and that...

Janine: They disrespect it.

Interviewer: So who... who are “they”?

Janine: Um... the people who do the vandalising.

Tara: The bad kids, they climb up on the trees and jump on the branches and they snap.

Interviewer: So are “they” people at this school?

Tara: Some are and some are not.

(Janine, Daniel and Tara, semi-structured group interview, November 2009)

Janine, Daniel and Tara also indicated that some students at the school were displaying care and concern for the environment, while others, possibly including people from outside the school, did not appear to ‘care’ about the environment.

Reece and Henry also indicated that there were varying levels of care and concern for the school environment amongst the students at the school:

Reece (tentatively): ...it could be nice... Yeah, well, it was good... well, when it was at its good part we could go into the bush, and then it started getting worse, and kids left all their rubbish...

Interviewer: Oh, when was that...?

Reece: That was a couple of months ago.

Henry: That was about halfway through this year.

Reece: Yeah, about the second term.

Interviewer: OK, so that was when you could go into the bush?

Reece: Yeah, and it was really cool, but then (unintelligible)...

Interviewer: So people started making it messy again?

Reece: Yeah...

Interviewer: Oh really, were they people your age, or younger or...?

Henry: Lots of little kids...

Reece and Henry together: R3 and R1, they, like go in with their food and they leave lots of rubbish...the naughty kids...

Interviewer: So you're not allowed in there again now?

Reece and Henry together: No.

Reece: They say they're going to sort something out but they don't...

(Henry& Reece, semi-structured group interview, November 2009)

Kylie, Molly and Rose seemed to feel more optimistic about their [school] environment, and thought that there were more students showing care and concern for it, possibly because they were 'told' to care by the teachers:

Rose: Um...it's getting a bit safer now I think...

Everyone together: Yeah.

Kylie: I actually think it's getting a bit better.

Interviewer: OK, in what way?

Kylie: Just, like, tidying it up and not leaving rubbish around.

Everyone together: Yeah.

Rose: Yeah, 'cause I was looking in the native bush area and there wasn't heaps of rubbish there.

Interviewer: OK, so there are some areas where there is more rubbish and some where there is less?

Everyone together: Yeah.

Rose: But before there was like, heaps of stuff in the native area, but now there isn't.

Interviewer: OK, so is it because people are being told "don't do this!" Or is it because they actually care?... Or is it a bit of both?

Kylie: A bit of both.

Rose: Told!

Kylie: I would really say mostly told.

Everyone together: (Laughs) ...yeah...

(Kylie, Molly and Rose, semi-structured group interview, November 2009)

Siena and Devon thought that the environment at the school was both 'good' and 'bad' "because... some of the stuff is really bad and most people at the school actually pollute around the school, they just leave their stuff around and that...and they break tree branches.Because they know now that they can actually do it without teachers actually seeing them... because that bush over there...no-one's allowed in it unless you're going to look at the birds and that...and then more people make up lies and then they go in there and start breaking stuff and that..." (Siena and Devon, semi-structured group interview, November 2009).

Two teachers, Sarah (Year 5 & Year 6) and Jessica (Year 4 & Year 5) were also asked in individual written questionnaires how they would describe their own views (as a teacher), and their students views of their physical environment (at school in particular) with respect to education for sustainability and if they felt they had changed over the year. Jessica said that both the students and she as a teacher were a lot more aware of the physical environment and that the students often came to her with ideas about what they thought they should change at the school to make it more attractive (Individual questionnaire, Jessica, December 2009). Sarah again referred back to her answer from a previous question regarding how she thought her students viewed their physical environment, i.e.

that they seemed ‘more aware’ of the environment (Individual questionnaire, Sarah, December 2009).

These responses appeared to indicate that attitudes and values relating to care and concern for the school environment, and how the environment ‘looked’ in terms of ‘tidiness’, were of primary interest to the students. These attitudes and values were extremely variable amongst the students. The Year 5 and Year 6 students interviewed here seemed to think that there was less care displayed by the younger students, and the ‘naughty’ students at the school. Attitudes and values that reflect feelings of concern are one of the key aims of EfS (MoE, 1999), and could also be considered an enabling factor in the development of a whole school approach to EfS. Students that have a sense of belonging and ownership in their living and working spaces, such as school and home, may be more likely to display attitudes of care and concern. Students may gain a sense of belonging and ownership if they are involved in decision-making processes within the school. There was no evidence during these interviews of the students being aware of the aspects of ‘Place’ as described by Enviroschools (2014), i.e. (1) That the school grounds demonstrate how ecosystems work; (2) Whether or not the buildings and grounds are a learning resource; (3) Whether or not the buildings are designed to work with natural systems; and (4) That the whole school environment reflects the culture and heritage of its place and people (Enviroschools, 2014).

7.5.2 Awareness that the environment sustains people and ecosystems

Asking the students if they thought it was important to look after their environment (not only at the school), appeared to prompt them to express knowledge that connected together the ‘health’ of the environment and their own personal health/existence.

When asked if they thought it was important to look after the environment, Tayla, Christie and Kelly responded:

Everyone together: YES!

Interviewer: OK, why?

Christie: So we can keep ourselves safe.

Tayla: Yeah, and like the native birds and if we put rubbish on the ground it could get... (unintelligible).

Christie: I know how we could keep ourselves safe...to stop people going out of bounds... you can make an electric fence, so if they try to jump the fence and run away it would just go bzzz...!

Tayla: If you don't care for the environment and you keep chopping down the trees and doing stuff like that there would be no trees and no oxygen...

Interviewer: So in the future, when you're older, you're going to want the same choices you have now aren't you?

Tayla: We want (unintelligible) to keep on living.

Christie: But I think they can cut down trees (but not as much) as long as they plant another one.

Tayla: As long as they plant more.

(Tayla, Christie & Kelly, semi-structured group interview, November 2009)

During this conversation with Tayla, Christie and Kelly it emerged that they possessed an awareness that the environment sustains life, and that they considered it important to care for this environment.

Janine, Daniel and Tara initially appeared somewhat uncertain about why it was important to look after their environment, although they did seem to have an awareness that the environment was important for supporting nature:

Everyone together: Yes.

Tara: I have no idea [about why it was important to look after the environment].

Daniel: I think it's um...I don't know...

Interviewer: OK, what do you think? (to Janine)

Janine: Well it's really old and it's really special... like to the Ferndale [unintelligible]...

Tara: It's special to the birds.

Janine: It's really important because lots of kids are still here and they only just started and it would be sad if, like everything died here and they wouldn't get to enjoy all the nature.

(Janine, Daniel and Tara, semi-structured group interview, November 2009)

Henry and Reece also appeared to understand that the environment supported life and needed care:

Henry: Yes, because if we don't look after it, the birds might, like start dying and we want to attract more birds... we don't want any... we're trying not to get...well, not many people want stuff extinct, and if we keep polluting everything will become extinct, and then plants will start dying and then there'll be no oxygen and everyone will die.

Reece: They've even got popcorn in the tree!

Interviewer (laughs): Yes I saw those... they were in those... um... round pinecone things...

Reece and Henry together: Yeah.

Interviewer: What did you stick in the pinecones?

Reece: Oh we didn't do it.

Interviewer: Oh, that was the other group? The next class?

Henry: No, it was the staff, the teachers did it.

Interviewer: Oh, they made the popcorn didn't they?

Reece and Hunter together: Yeah.

Reece: ...but then they probably ate half of it...

Reece: I think it is important to look after the environment...

Interviewer: OK, but why?

Reece: Because, well, we're kind of doing a thing where we're trying to attract birds and that, and now we're kind of... we're just doing a massive thing about trying to help birds survive...so we made weed killers and stuff to kill the weeds so the birds can eat the plants...

(Reece and Henry, semi-structured group interview, November 2009)

Kylie, Molly and Rose were also asked if they felt it was important to look after their environment:

Kylie and Molly: Yes!

Interviewer: OK, why?

Molly: Because if we don't look after our environment, the world's going to turn into a dump, it's just gonna...

Kylie: ...it all ties in with sustainability...

Molly: ...and global warming...

Kylie: ...yeah, global warming...

Molly: Global warming's all just happening again and animals are all dying all because of us (said in a 'dramatic' voice, both students laugh).

(Kylie, Molly and Rose, semi-structured group interview, November 2009)

When asked if they thought it was important to look after their school environment, Regan and Jason agreed that it was important to care for their school environment (Regan and Jason, semi-structured group interview, November 2009). They went on to elaborate:

Jason: Since we've been researching it's like, well if we don't have the environment, we wouldn't be here.

Interviewer: That's true isn't it, and it's not just about the plants and things, it's you and being able to do stuff as well.

Jason: 'cause we're part of the environment as well.

Regan: I actually think a bit more now because it's becoming more fun, we're getting more responsibility. The teachers usually ... (unintelligible)...hire people to do it.

Jason: They're like, trusting us more.

(Regan and Jason, semi-structured group interview, November 2009)

Regan and Jason noted that they liked having 'more responsibility' and that the teachers appeared to be trusting them more.

During these interviews the students indicated an understanding that it was important to care for their environment because it helped to keep them, and other animals such as birds, alive. This could be considered an enabler in the

development of a whole school approach to EfS. The awareness that ecosystems support life is a key aspect of ‘Place’ whereby the school grounds demonstrate how ecosystems work, and provide students with opportunities for experiencing an interconnection with nature (Enviroschools, 2014).

7.5.3 ‘Place’ summary

Students generally indicated that they held attitudes and values of care and concern for the environment. They did not openly acknowledge, at this stage, a connection between their school environment and aspects of ‘Place’ as described by Enviroschools (2016), i.e. that the school grounds demonstrate how ecosystems work; that the school buildings are designed to work with their natural systems; that their buildings and grounds were a learning resource; or that the whole school environment reflected the culture and heritage of the place. They disapproved of aspects of the environment that they considered dirty, untidy, ‘old’, inconvenient and ugly, and preferred areas that they considered attractive, tidy, fun, and comfortable. Attitudes and values that relate to care and concern for the environment could be considered enabling factors in the development of a whole school approach to EfS.

When students were then asked they if they thought it was important to look after their environment (not only at the school), they then expressed an understanding that the ‘health’ of the environment was important to their own survival, and that of other animals such as birds. This is in concurrence with the aspect of ‘Place’ which describes how school grounds can demonstrate how ecosystems work and provide students with opportunities for experiencing an interconnection with nature (Enviroschools, 2014). This can also be considered an enabling factor in the development of a whole school approach to EfS.

7.6 Chapter summary

This Chapter has provided an outline of the themes that emerged in terms of ‘people, programmes, practices and place’ during a phase of the school’s development of a whole school approach to EfS that was considered to show

‘outcomes’ of the whole school approach. It also highlighted factors that may act as enablers or inhibitors in the implementation EfS across the school (see Table 7.2)

Table 7.2 *Enablers and Inhibitors to the outcomes of a whole school approach to EfS*

| EfS Enablers | EfS Inhibitors |
|--|---|
| Students consider environment to be everyone’s job to look after. | School vision map not fully understood by students. |
| Students have some role in school decision-making. | Principal not prioritising EfS or making provision for regular full staff professional development and learning in EfS. |
| Some resources are present in classes to help students understand concept of sustainability. | Students did not appear to understand depth of knowledge around sustainability. |
| Professional development and learning with the EfS Facilitator. | Lack of EfS facilitation over time not keeping EfS a strong presence in school. |
| EfS tasks are engaging for students. | Teachers apparent lack of deep understanding of the nature of sustainability and how to implement EfS appeared to be affecting student learning outcomes. |
| Students showing attitudes and values of concern and care for the environment. | |
| Teachers considered there to be some staff cohesion present. | |
| Waste minimisation occurring in school. | |

The responses from the Year 5 and Year 6 students indicated that there were mixed ideas about the ultimate purpose of the vision map, with the students generally appearing to be unsure of the ultimate purpose of what they had been involved in. It also appeared that the vision map was only being worked on in a small part of the school. The vision map task may have been more enabling if it had involved all students and been viewed as a working document and if it’s ultimate purpose had been made clear to the students.

Students indicated that they thought it was ‘everyone’s’ job to look after the environment. This could suggest that they considered it important for all people in their community to participate in caring for their environment, which is an important, enabling aspect of ‘People and Participation’ (Enviroschools, 2014). Data collected approximately two years after the school’s EfS journey began indicated that students had some involvement with school decision-making, which can be considered an enabler in the process of developing a whole school approach to EfS.

The influence of the principal on Ferndale school’s EfS journey was a recurring concern for the EfS Facilitator. In particular, this included the role of the principal in the provision of support with respect to establishing collaborative working relationships across the school and supporting the involvement of staff in professional development with respect to EfS. The actions of the principal appear pivotal in enabling or inhibiting of the whole school approach to EfS.

Students appeared to struggle with providing a definition of the complex subject of sustainability: a common theme across the student responses was the idea that sustainability was ‘about things lasting a long time’ and ‘using fewer resources’. This lack of in-depth understanding on the part of the students could act as an inhibitor in the development of a whole school approach to EfS. Almost a year after the school had finished its first year of EfS integration, the staff responded in a written focus group session that they felt that the students understanding of the concept of sustainability had not changed as there had been no emphasis on sustainability in their teaching and that they hadn’t reinforced it. This lack of reinforcement of sustainability by the staff during the year coincided with the absence of the EfS Facilitator in the school during that year, and was likely to have acted as an inhibitor in the development of the whole school approach to EfS.

Teachers’ opinions on any possible changes to their understanding of EfS over the year varied: one felt it had remained much the same during the first year of the whole school approach to EfS, whilst another thought she now thought that she had a greater understanding of what sustainability was and how it could be linked

to education. It was possible that the changes in understanding were related to the amount of professional learning that the teachers participated in. Approximately a further year after finishing the first year of integrating EFS into the school, the teachers responded in a focus group that their understanding had not changed because it had not been reinforced with any professional development sessions as their EFS Facilitator had stopped visiting the school. This lack of professional development could be considered an inhibitor in the development of the whole school approach to EfS.

Some of the teachers considered that the students' learning in EfS had improved over the year and cited informally noted increased levels of interest in learning, and increased ability to talk about their learning and why they were learning it. The staff focus group responded that, a year after finishing the first year of the whole school approach to EfS, student centred learning approaches were being used. This can be considered an enabling factor in the development of a whole school approach to EfS.

The teachers felt that they had benefited from some collaborative aspects of a whole school approach, which is an enabling factor. A year after concluding the first year of EfS integration, the staff had been working without the support of the EfS Facilitator which seemed to have affected their progress into the development of a whole school approach as sustainability appeared to be playing a background role in the school's programmes.

It appeared that the students were enthusiastic about waste minimisation practices both towards the end of the first year of EfS integration and roughly two years after starting their whole school approach to EfS. Waste minimisation is one of the practices that a school can engage in which supports the whole school approach to EfS (Enviroschools, 2014). The students seemed mainly focussed around attitudes and values relating to care and concern for the environment. They disapproved of aspects of the environment that they considered dirty, untidy, 'old', inconvenient and ugly, and preferred areas that they considered attractive, tidy, fun, and comfortable, possibly reflecting an anthropocentric view of the environment. Attitudes and values that relate to care and concern for the

environment could be considered enabling factors in the development of a whole school approach to EfS.

Students expressed a rudimentary understanding that the ‘health’ of the environment was important to their own survival, and that of other animals such as birds. This is in concurrence with the aspect of ‘Place’ which describes how school grounds can demonstrate how ecosystems work and provide students with opportunities for experiencing an interconnection with nature (Enviroschools, 2014). This can also be considered an enabling factor in the development of a whole school approach to EfS.

Chapter Eight

Discussion and conclusions

8.1 Introduction

This thesis has examined the development of a whole school approach to Education for Sustainability (EfS) in a primary school. It has sought to make a contribution to the knowledge and understanding surrounding this process by investigating the following questions:

1. How can a whole school approach to EfS be planned in a New Zealand primary school?
2. How was a whole school approach to EfS implemented in a New Zealand primary school?
3. What were the outcomes of the whole school approach to education for sustainability in terms of student learning, teacher development and school change?

Answers to these questions may assist schools in their own EfS journeys by providing insight and clarity around the process of development of a whole school approach to EfS. Detailing the factors that enable and inhibit the development of a whole school approach may provide schools with the direction needed to avoid possible pitfalls, and focus on factors that progress the development of EfS in their school. Further knowledge around the student learning outcomes relating to EfS may help schools to develop their EfS programmes in such a way as to maximise student learning opportunities.

A review of the EfS literature and of that relating to whole school approaches and transformative learning indicated increasing evidence in support of the need to transform many current education systems towards modelling sustainability in all areas of school life.

This study has interpreted themes that have emerged from interviews with staff, students and the EfS Facilitator within a case study of a rural primary school. The study has also drawn themes from observations of staff meetings and class sessions, both with and without, the assistance of the EfS Facilitator. This data has allowed the development of a whole school approach to EfS to be viewed in terms of overarching themes within four key areas of schooling life that can have an influence on student learning in EfS, i.e. the people (and their participation), the programmes, the practices and the place. These themes were presented in Chapters 5 to 7.

This chapter draws together findings from this study, leading towards some conclusions and suggestions for further study. It starts by presenting the responses to each of the three research questions with respect to ‘People (and Participation)’, ‘Programmes’, ‘Practices’ and ‘Place’.

8.2 Response to the research questions in the context of ‘People (and Participation)’, ‘Programmes’, ‘Practices’ and ‘Place’.

The Enviroschools programme supports a ‘whole centre/school approach’ to EfS, and describes four key areas of schooling life that have an effect on sustainability and student learning, i.e. the People (and Participation), the Programmes, the Practices, and the Place (Enviroschools, 2016). At this early stage in the development of the planning of a whole school approach to EfS, the facilitator noted that embedding EfS within the ‘People, Programmes, Practices and Place’ aspects of the school was of paramount importance. While there is of course overlap between these four aspects, it has been possible to extract and examine distinct themes within each of these key aspects of a whole school approach to EfS.

8.2.1 Response to question one –

How can a whole school approach to education for sustainability be planned in a New Zealand primary school?

8.2.1.1 People

The findings of this research during the planning stage of the development of the whole school approach to EfS emerging from the ‘people’ aspect included the following themes: school leadership, teacher’s knowledge and understanding of EfS, and collaboration and whole school community participation.

School leadership

The school leaders at Ryelands School (i.e. the principal and the lead EfS teacher) appeared to have a relatively simple, anthropocentric view of EfS, which was based around two key concepts: firstly, that sustainability was based primarily on the notion of maintaining something over time, i.e. that it had a futures focus; and secondly, they considered sustainability to have a systems and resources element, e.g. recycling and energy consumption (MoE, 2007; MoE, 2016). The staff also seemed to be primarily concerned with sustainability outcomes rather than perceiving value in the educational processes themselves that were required to achieve the outcomes. While recognising that EfS is issues-based, it is important to place value in the skills of identifying, investigating and resolution of the issue (Tilbury, 1995; MoE, 1999) During the planning stage, the staff did not indicate any understanding of other key aspects of EfS, such as its holistic nature, the importance of EfS-related values and attitudes, the action component, and the emphasis on the development of critical thinking skills (Sterling, 2014; Tilbury, 1995; MoE, 1999; MoE, 2017).

The lead EfS teacher saw her role as providing support for the students’ learning about how they could sustain the environment at their school, while the principal saw her role as supporting the development of the whole school approach with resources, time, money and leadership. Pro-active leadership is a key aspect of whole school innovations (Priestly & Sime, 2005), and while the principal

appeared aware of the need for leadership to support the process of change, there was limited evidence of challenging the existing paradigm within the school towards a view which may have supported change towards sustainability (Carr, 2016). Specific aspects of leadership for change which may have further driven the school through its process of change were not clear during the planning stage. These aspects include: the revision of organisational structures of the school; creating implementation plans incorporating the development of a management structure appropriate to the proposed innovation; creating a culture of teaching staff collegiality, commitment and ownership of the innovation; and effective sustained teaching staff professional development to support their engagement with, and commitment to changed practices (Prain & Hand, 2003).

EfS also requires a leader who can create conditions that empower rather than control, as may be effected by distributed leadership within a school (Carr, 2016). While the school principal appeared to have made provision for distributed leadership, as indicated by Brianna taking the role of lead EfS teacher in the school, it was not clear whether this leadership was effective in producing a shift in thinking towards a deep knowledge of sustainability and the propensity to take united action across the staff (Pepper & Wildy, 2008). Torrance (2013) observes that while the concept of distributed leadership may have gained prominence in many schools, distributed leadership may be challenged by assumptions that may not hold true for the individuals involved, e.g. not every staff member is able to lead, leadership is not legitimised simply by the principal's endorsement, and that a distributed perspective occurs naturally. Torrance (2013) further proposes that a concept of parallel leadership may instead be more useful in effecting change within a school, i.e. that school leaders and their principals engage in collective action to develop the school's capacity for change. It was not readily apparent that the principal attributed the same level of priority to EfS as that of the lead EfS teacher. This may have contributed to there being a limited degree of collective action between the two individuals, or between these two leaders and the other two participating staff members, which may have helped develop a deep understanding of sustainability and EfS within the school.

The depth of understanding of EfS that was demonstrated by the school leaders, and their apparent understanding of the specific skills required for leadership of a

whole school innovation, seemed to influence and limit their perception of their roles within the school and their resulting actions. Research in the field has highlighted the importance of how the attitudes of school leaders towards sustainability education are influenced by their own understanding of sustainability education (Buchanan, 2013; Perry, 2013; Redman, 2013). This is further elaborated by Simovska & Prosch (2016) who consider that the attitude of school leaders towards sustainability education determines its position in the curriculum, the amount of professional learning and development that staff participate in, and the prioritisation of collaboration between the school and community.

Teacher's knowledge and understanding of EfS

A second theme that emerged during the planning stage of the school's whole school approach to EfS was that the understanding of EfS demonstrated by the school leaders and teachers at Ryelands School determined what and how they taught. Ryelands School appeared to be starting their EfS journey by focusing on a few key concepts within EfS, such as building knowledge and understanding around sustainability, specifically habitats and the biophysical environment; and waste/energy minimisation. This level of understanding of EfS - related planning evident during this early stage of the school's EfS journey appeared likely to be linked to the level of understanding of EfS demonstrated by the school's leaders and teaching staff. Their understanding determined what they gave priority to when planning a whole school approach to EfS in the school. During the planning stage of the whole school approach to EfS, it was apparent that the teachers viewed the development of students' knowledge and understanding of the natural environment as paramount. Additionally, they considered the development of students' awareness and sensitivity to the natural environment and related issues to be important. This is in concurrence with two of the five aims of EfS as outlined in the *Guidelines for Environmental Education in New Zealand Schools* (MoE, 1999, p. 9). The teachers appeared to have an awareness of the need for intergenerational equity and acknowledgement of the physical environment, or 'place', and the sustainability practices within the school. However, the EfS Facilitator felt that the staff needed to expand their understanding of EfS beyond

that of the physical school environment only. The teachers at Ryelands school did not demonstrate an understanding of further key concepts of sustainability such as equity, interdependence and responsibility for action (Sterling, 2014; MoE, 2017).

Collaboration and whole school community participation

Two important aspects of a school modelling sustainability are the presence of reciprocal partnerships between the school, students, families, community and stakeholders, and whole-school participation in planning and actions (Henderson & Tilbury, 2004). There appeared to be varying staff perspectives on the levels of community support and involvement, from very little involvement of some groups to considerable parental involvement and support in school activities. Higher levels of parental and community involvement could potentially act as enablers during the planning phase, whereas lower levels of participation could potentially act as inhibitors. Additionally, the school leaders did not consider the multi- and bi-cultural aspects of the school's community to be particularly well addressed. The Māori cultural concepts included in the Enviroschools programme (Enviroschools, 2014) were considered to be a helpful context for developing students' attitudes of care and concern for the environment. Involvement of the school's community and students in the planning of a whole school approach is a key feature of a school modelling sustainability (Enviroschools 2016; Henderson & Tilbury, 2004). While there appeared to be some involvement from the community with the school, it was not apparent that the community and students were specifically involved in the planning of the integration of a whole school approach.

The small size of the school could be considered a useful feature in allowing greater collaboration between staff and to allow all the staff to participate in leadership decisions during the planning stage of the development of the whole school approach. However, the EfS Facilitator felt that the small size of the school did not automatically create a collaborative working environment and noted that what was important was that the staff actively worked together to create cohesion. The EfS Facilitator also expressed a view that students be given ownership during the planning stage in order to empower them to become

involved. Collaboration between staff, students and the community is an integral part of a whole school approach to EfS (Enviroschools, 2016; Henderson & Tilbury, 2004) which was only emergent at this stage.

Summary

The findings of planning a whole school approach to Ryelands School have indicated that a limited understanding of EfS and priority given to EfS amongst school leaders may have impacted upon their EfS leadership. Teachers were tending to focus on developing their students' awareness and understanding of sustainability, particularly with respect to the school's physical environment, and there was some recognition from the staff that cultural aspects within the school may provide a useful context for learning about EfS. There appeared to be a low level of student or community involvement in planning for EfS.

8.2.1.2 Programmes

The findings of this research during the planning stage of the development of the whole school approach to EfS emerging from the 'programmes' aspect included themes of: school structures e.g. staff meetings; teacher PL and development; teaching and learning focus; attitudes and values of the students; transdisciplinary approaches; teaching and learning approaches; student participation; and assessment in EfS.

School structures

Staff meetings were held at Ryelands School during the planning phase that allowed the EfS Facilitator to introduce the teachers to several planning documents through which they could integrate EfS into their teaching programme. While on the surface it appeared that these meetings were enabling development of the school's whole school approach to EfS, the fact that these meetings were rarely held with every staff member, including the principal, was, in fact, an inhibiting factor to their progress. The irregular presence of all the staff at the meetings might have been indicative of a low commitment to attend the meetings

for the staff. Information from the meetings ran the risk of being diluted and misunderstood by other staff members when it was relayed to them. The physical location, the physical structure, of the staff meetings also impacted upon the focus of the meetings: the meetings were held in a very ‘public’ location with support staff frequently coming and going through the room. When school structures are modified to allow for increased collaboration and more effective communication, this can assist in the development and sustainability of professional learning communities that have a shared vision and focus on student achievement (Byrne-Jimenez & Orr, 2012; Henderson & Tilbury, 2004).

Teacher professional learning and development

The professional learning and development experiences around EfS available to the teachers were based around visits from an EfS Facilitator during the planning stage of the whole school approach to EfS. However, these rarely included all the staff. In a number of cases the lead EfS teacher was the only staff member present during the sessions with the EfS Facilitator. It has been argued that teacher professional learning experiences can provide useful support for integrating EfS into the school practices (Cowie & Eames, 2004). Educational leaders have a key role in promoting and developing professional learning about EfS and development opportunities for teachers (Timperley, Wilson, Barrar & Fung, 2008). The school leader, i.e. the principal, did not appear to be actively promoting professional learning in EfS for the staff.

Teaching and learning focus

The teachers at Ryelands School appeared to be focussing their teaching in EfS, during the planning stage, on the development of students’ knowledge and understanding of the environment, and basic biological concepts. Specifically, discussions during the planning meetings between staff and the EfS Facilitator revolved around ‘science topics’, such as “what is an environment?” and “what could they learn from their own school environment?”, which are appropriate but somewhat narrow foci (MoE, 1999, p. 9). The teachers could have been focusing on this aspect of EfS during the planning stage because they felt it was a useful

starting point from which to develop further ideas about EfS, or, because it indicated the limits of their understanding of EfS at that time. This could have acted as an inhibitor to students' learning in EfS as it did not address other aspects considered to be important in EfS, namely its holistic, issues-based nature, the notion that EfS is action-oriented, or the importance of the development of critical thinking skills that are required for effective decision making (Sterling, 2014; Tilbury, 1995).

Attitudes and values of the students

One other key aspect of EfS that teachers were interested in during the planning stage was instilling attitudes and values in their students that would prompt them to care for their environment at school, both for them now and for future students. This in congruence with the Guidelines for Environmental Education available to teachers in New Zealand (MoE, 1999, p. 9) and a key aspect of a whole school approach to EfS (Henderson & Tilbury, 2004).

Transdisciplinary approaches

Transdisciplinary approaches to EfS and the curriculum was a key feature of a whole school approach which Ryelands School appeared to be struggling with during the planning stage. While the EfS Facilitator presented the staff with planning guides outlining ways in which they could integrate EfS across the curriculum, the teachers felt they needed to focus on improving the students' limited knowledge and understanding about basic biological concepts prior to engaging in EfS. The teachers appeared to view EfS as a 'science topic' or 'nature study' for older students with greater reading skills to be studied 'package style' within curriculum areas such as science, social studies and technology. Historically, teachers have presented EfS-related information to students in the hope that it would provide them with the knowledge and skills to go forth and act accordingly (Eames, Wilson-Hill and Barker, 2013; Lynagh et al., 1997; Wyn et al., 2000). However, there is little evidence that 'package' presentation has any long-term impact on students' lives (Lynagh et al., 1997). When sustainability is presented in 'package' format, EfS is not necessarily being reinforced by any

other aspect of the student's daily life at school and it is inevitable that this approach obscures the significance of the broader life patterns of young people (Wyn et al., 2000), i.e. this is an inhibiting factor.

Teaching and learning approaches

The teachers at Ryelands School appeared to understand that some approaches to learning would be useful in delivering EfS, as they mentioned the probable use of problem-solving, 'hands-on' learning and inquiry-type learning during the planning stage of the integration of a whole school approach. The teaching and learning approaches that have been shown to support a whole school approach to EfS typically include inquiry-based learning, discovery learning, role-play, simulation, values clarification and analysis, and experiential learning (Eames, Wilson-Hill & Barker, 2013). Other approaches deemed to be important in EfS such as sharing, listening, co-operation, negotiation, co-learning, collaboration, reflection, and a future orientation (Tilbury, Coleman & Garlick (2005), were not apparent in teacher thinking during planning.

Student participation

It appeared that while teachers were aware of the need for student participation in planning their learning, they struggled to translate the theory of this into practice. The notion of whole-school participation in planning and action (Henderson & Tilbury, 2004) caused the teachers some concern about having reduced control over lesson planning, and allowing the students to 'do' most of the planning. It may have been that their limited understanding of EfS theory, and lack of opportunities to observe EfS in practice, for example in other schools, may have fuelled this uncertainty.

Assessment in EfS

A range of different EfS assessment methods were suggested by staff during the planning stage that were, for the most part, in alignment with the Enviroschools 'reflect on change' section of their 'action learning cycle' (Hamilton City Council,

2005). The 'Action Learning Cycle' is the main tool used by 'enviroschools' to help plan and carry out student-led projects. It aims to empower individuals to investigate, explore ideas, make decisions, take action and reflect on the changes they have created (Enviroschools, 2016). The staff at Ryelands School appeared to understand that it would be useful to reflect on change when the time came to be implementing EfS in the school.

Summary

The irregular presence of all the staff at the Professional Learning meetings with the EfS Facilitator may have had a negative impact upon the information that staff received. During the planning stage of the school teaching programmes, the teachers at Ryelands School appeared to be focussing on developing students' knowledge and understanding of basic biological concepts and the environment. The teachers were also interested in instilling attitudes and values in their students that would prompt them to care for their environment at their school. Teachers appeared to be struggling with transdisciplinary approaches to EfS and integrating it into the curriculum during the planning stage. The teachers at Ryelands School appeared to understand that teaching approaches such as problem-solving and 'hands-on' learning and inquiry-type learning would be useful in delivering EfS. Teachers were aware of the need for student participation in planning their learning, but struggled to translate the theory of this into practice. EfS assessment methods were suggested by staff during the planning stage that were, for the most part, in alignment with the Enviroschools 'reflect on change' section of their 'action learning cycle'.

8.2.1.3 Practices

The findings of this research during the planning stage of the development of the whole school approach to EfS emerging from the 'practices' aspect included themes of: the issues-based nature of EfS; waste minimisation practices; and the considered use of resources.

While sustainable practices did not feature greatly in observation data, it seemed that staff recognised the importance of waste minimisation, wise use of energy, composting of food waste, and care of water resources. They also understood that these practices needed to be monitored over time, with progress being made towards sustainability. This is in alignment with Enviroschools philosophy (Enviroschools, 2016) and recognises that EfS is issues-based: it involves people in identification and investigation of environmental issues leading towards possible solutions or actions towards resolution of the issue (MoE, 1999; Tilbury, 1995). The teachers also seemed to understand that sustainable practices aim to reduce/eliminate environmental issues such as waste of resources and/or energy. However, it was not clear that they understood how sustainable practices arise as a response to a sense of responsibility through participation and action (MoE, 1999).

8.2.1.4 Place

The findings of this research during the planning stage of the development of the whole school approach to EfS emerging from the ‘place’ aspect indicated the view that ‘place’ referred to the external, natural environment only.

During the planning stage of the whole school approach to EfS, the teaching staff were restricted in their views of ‘place’ to the external ‘green’ environment only (i.e. the native bush section of the grounds), and how this could be developed for student learning about sustainability. The school buildings and how they could be developed and utilised to assist in learning about sustainability did not appear to be recognised by staff at this stage. While recognition of the natural environment is an integral part of the development of a whole school approach to EfS, limiting understanding of the concept of environment, i.e. ‘that green space over there’, could serve to inhibit the development of EfS within the school as it does not acknowledge the holistic nature of EfS (Tilbury, 1995).

8.2.1.5 Enablers and inhibitors to the planning stage of the whole school approach to EfS

Key enablers to the planning of the whole school approach that were identified included:

- Teacher interest
- Presence of EfS Facilitator
- Small size of school
- United staff interest in EfS
- Enthusiasm to integrate bicultural aspects into school teaching and learning
- Strong sense of belonging and ownership from parents/caregivers
- An understanding of the importance of inquiry learning approaches
- A basic understanding of sustainable practices

These factors were considered enabling factors in the planning of a whole school approach as they align with a number of the key features of a school modelling sustainability as identified by Henderson & Tilbury (2004), such as pro-EfS values, relevant teaching approaches in EfS, and a sense of collegiality and a degree of whole school planning (limited to the teaching staff only at this stage). EfS facilitation has the capacity to help schools understand how to develop and deepen their work relating to sustainability, which appeared to be occurring at this stage (Rickinson et al., 2015).

Key inhibitors that were identified during the planning of the whole school approach to EfS included:

- Lack of teacher professional development and learning in EfS.
- Limited staff understanding of EfS and EfS in practice.
- School not reflecting cultural diversity.
- Varying levels of involvement from the school community.
- Teachers perceive EfS as a science ‘topic’.

- Limited understanding of the depth and breadth of the divisions of ‘People (and participation)’, ‘Programmes’, ‘Practices’ and ‘Place’

These factors were considered inhibiting factors in the planning of the whole school approach as they may contribute to the ‘missing’ elements of a successful whole school integration of EfS (Enviroschools, 2016, Henderson & Tilbury, 2004). The presence of these inhibiting factors indicated that the implementation of a whole school approach to EfS was not fully in alignment with the concept of a whole school approach to EfS and may have affected the path they took when implementing EfS. A key inhibitor during the planning stage may have been the staff perception that EfS is a separate ‘subject’ to be studied, rather than to be treated in an holistic or transdisciplinary manner as this perception may have directed the teachers’ future focus down a path that was not congruent with EfS learning theory (McClam & Flores-Scott, 2012; Tilbury 1995).

8.2.2 Response to question two - How was a whole school approach to EfS implemented in a New Zealand Primary school?

Four key areas of schooling life that have an effect on sustainability and student learning are People (and Participation), the Programmes, the Practices, and the Place (Enviroschools, 2016). The following findings emerged from the second research question under these four points.

8.2.2.1 People

The findings of this research during the implementation stage of the development of the whole school approach to EfS emerging from the ‘people’ aspect included: EfS Facilitator modelling, teacher perception of student understanding and tasks, issue of staff cohesion, issue of whole school transformation, school leadership and whole school change.

EfS Facilitator modelling

During the early implementation phase, the EfS Facilitator spent time in each of the classrooms and appeared to be modelling to the classroom teachers various approaches they could use to develop students' reflective and critical thinking skills, and students' participation in discussions around EfS. By modelling these teaching approaches, the EfS Facilitator was attempting to demonstrate one of the key principles of a whole school approach to EfS, which is the importance of inclusive and democratic teaching and learning approaches that value critical thinking and active participation (Henderson & Tilbury, 2004). This modelling approach is an aspect of professional learning and development that can provide teachers with the opportunity to shape their understanding of EfS in practice (Timperley et al., 2008).

Teacher perception of student understanding and tasks

During the implementation phase some teachers' understanding about sustainability seemed to have developed beyond their initial ideas that were based around producing a clean and tidy physical environment, towards teaching and facilitating skills that would help enable EfS within the school. For other staff members, their views on teaching EfS were much the same as at the beginning of the year. The teachers' varying levels of understanding of EfS may have been related to the amount of professional learning that each individual participated in. Their level of understanding appears to have also influenced what they taught their students and how they perceived their learning. The teachers seemed to think that the younger students (Year 2 and Year 3) were struggling to participate in EfS discussions because of their young age and limited knowledge and understanding. The teachers felt that the older students (Year 4, Year 5 and Year 6) possessed greater knowledge and understanding around sustainability because they demonstrated an ability to communicate effectively in EfS discussions and had greater motivation to participate in EfS tasks. Teachers need to be able to understand the way different groups of students learn about EfS, and what the students are likely to actually learn about sustainability (Timperley, Wilson, Barrar & Fung, 2008), for example, the younger students may have benefited

from EfS tasks and discussion questions more specifically tailored to their age and level of knowledge and understanding.

Issue of staff cohesion

It seemed that when implementing the whole school approach to EfS, developing staff cohesion and participant ownership, including student participation, had been proving difficult at Ryelands school. The staff seemed to be generally unsure of what direction they were taking in terms of integrating EfS into the whole school system. The observation that professional development with the EfS Facilitator was not consistently being done with all the staff during the implementation stage is likely to have contributed to the difficulties in achieving whole school cohesion during the implementation stage. Dialogue and collaboration between participants is a key factor in successful change (Priestly and Sime, 2005). Communication between participants may lead to greater cohesion. The issues of staff cohesion and direction may have been better addressed with leadership that provided strong implementation plans to support a culture of collegiality and professional learning opportunities (Prain & Hand, 2003).

Issue of whole school transformation

There were also a number of additional indications that the whole school approach to EfS was being implemented in a fragmented and 'hurried' manner, as suggested by a variety of comments from the principal about pressure from the school's Board of Trustees to integrate EfS with greater speed. There was also limited evidence that implementation decisions were being made with the involvement of the students or other members of the community. When transforming a schooling system, the whole system needs to be transformed in a sustainable way, rather than in a piecemeal way. For effective school transformation, it is recognised that significant change in one part of a school system requires changes in other parts of the system (Duffy, 2006). The process of transforming a school system is complex and requires designing and implementing an entirely new paradigm of education, rather than changing a piece within the existing paradigm (Reigeluth, 2006). The transformation can take a

larger amount of time to fully integrate, and loss of motivation for the change can occur during this time if no visible signs of progress are seen (Reigeluth, 2006). Reigeluth (2006) describes how, for successful school-wide transformation, one must first change parts of the system that will exert leverage on the remaining parts, in order to prevent them from changing back to the original paradigm. Starting with a few high-leverage changes can make the whole systems change quicker and easier. Such changes could have included stronger implementation plans that incorporated the development of organisational structures that supported the process of change, and more effective, sustained professional learning sessions with the EfS Facilitator with greater attendance from all the teachers (Prain & Hand, 2003).

School leadership and whole school change

Henderson & Tilbury (2004) and Enviroschools (2016) describe whole-school participation as a key feature of a whole school approach to EfS, this was proving to be challenging for Ryelands School. A school leader's role when integrating systems change is to challenge the existing paradigm within their own learning community, and to support whole school transformation towards sustainability (Carr, 2016). Staff cohesion and participant ownership of the change towards sustainability may have been greater with leadership that displayed a higher priority towards sustainability, and made provision for effective and sustained professional learning for all staff (Pepper & Wildy, 2008; Prain & Hand, 2003). While the school principal appeared to be displaying an interest in implementing a whole school approach to EfS, developing a deep and broad knowledge of sustainability in all the staff did not appear to be a high priority. Given that the attitude of a school principal can determine its place in the curriculum (Henderson & Tilbury, 2004; Simovska & Prosch, 2016), and that leadership is key to managing change (Fullan, 2001), this lower priority ascribed by the principal may have inhibited the implementation of the whole school approach.

The integration of whole school change may also have benefited from leadership that specifically demonstrated understanding of the process of leadership for change (Fullan, 2001). Leadership skills for change that were not clearly evident

during the implementation phase included forward thinking and ability to imagine a different future, the development of a culture of collegiality, and an emphasis on interpersonal and networking skills which can build strong relationships (Pepper & Wildy, 2008; Prain & Hand, 2003). Fullan (2001) notes that it may be useful for leaders to understand the complexity of the change process, and that leadership for change may require a change in leadership style from the existing leadership paradigm. A school leader who displays these characteristics is more likely to emphasise the importance of professional learning and development experiences and prioritise collaboration between the school and community (Simovska & Prosch, 2016). These leadership characteristics were not prominent at this stage.

Summary

During the early implementation phase the EfS Facilitator spent time in each of the classrooms and appeared to be modelling to the classroom teachers various approaches they could use to develop students' reflective and critical thinking skills, and students' participation in discussions around EfS. The teachers' varying levels of understanding of EfS may have been influenced by the professional learning experiences that they had, and also influenced what they taught their students and how they perceived their learning. Developing staff cohesion and participant ownership, including student participation, had been proving difficult at Ryelands school. The staff seemed to also be generally unsure of what direction they were taking in terms of integrating EfS into the whole school system. The whole school approach to EfS was being implemented in a fragmented manner. Staff cohesion and participant ownership of the change towards sustainability may have been greater with pro-active leadership that supported the process of change.

8.2.2.2 Programmes

The findings of this research during the implementation stage of the development of the whole school approach to EfS emerging from the 'programmes' aspect included themes of: transdisciplinary approaches to EfS, EfS Facilitator

modelling and student-centred learning, developing students' knowledge and understanding, and developing a school vision map.

Transdisciplinary approaches to EfS

During the early implementation phase of the whole school approach to EfS, the EfS Facilitator emphasised the importance of infusing sustainability into the curriculum, as opposed to teaching EfS as a separate 'subject'. Findings show that in this early implementation stage, some staff saw teaching EfS as a 'unit' to be added onto the curriculum rather than integrated through the curriculum. Transdisciplinary approaches to EfS are key to a successful whole school approach to EFS (Henderson & Tilbury, 2004; MoE, 2017) and continued to present challenges to staff during the implementation stage.

EfS Facilitator modelling and student-centred learning

As previously described, the EfS Facilitator visited each of the classrooms and spent some time modelling to the teachers different ways to lead student discussion through facilitation and guided inquiry. These discussions appeared to be aimed at helping the students to think more deeply about their environment and to learn how to contribute their thoughts about sustainability to the group discussion (Enviroschools, 2014). The EfS Facilitator talked about how the staff could encourage student-centred learning approaches during the implementation of the whole school approach to EfS. Student-centred learning approaches are recommended by the Enviroschools Programme (Enviroschools, 2014) in order to help students gain competencies by initiating their own learning. Allowing students the chance to be listened to, to be supported in expressing their views and taking children's views into account (Shier, 2001) are three steps towards students sharing the power and maintaining transparency in the learning and decision-making process (Birdsall, 2010).

Developing students' knowledge and understanding

During the implementation stage the school's EfS programme appeared to be focusing on building student knowledge and understanding which is one of the key aims of EfS (MoE, 1999; MoE, 2017). However, this knowledge was limited to a 'scientific' understanding the environment only. Broad knowledge about and understanding of the natural and built environments and the holistic nature of EfS is also one of the key dimensions of Education for Sustainability, i.e. education *about* the environment (Barker & Rogers, 2004). Knowledge about the environment can contribute to helping students establish their own environmental attitudes and values (MoE, 1999). Other key concepts surrounding sustainability, such as equity, interdependence and responsibility for action (MoE, 2017) were not apparent during the implementation stage of the whole school approach to EfS.

Developing a school vision map

During the implementation phase, the students started on the process of preparing a vision map, allowing them to start to explore their attitudes and values with respect to their school environment. The practicalities of involving all the students in the production of a whole school vision map appeared to present difficulties for the staff. The support provided by the EfS Facilitator appeared to be aimed at helping teachers to translate knowledge of the vision map theory into practice.

These data seem to indicate that students were primarily influenced by what they saw around them and how 'clean and tidy' the physical space was. This may have been influenced by experiences in their own home lives, where cleanliness and tidiness are valued. The limited abilities of the teachers to scaffold the students in their thought processes may have had an impact on student responses to vision map tasks. The subsequent assistance of the EfS Facilitator, in providing the staff with questions which could help the students develop their attitudes and values with respect to their school environment, enabled the creation of the whole school vision map. It appeared that the whole school vision map was an 'activity' being

carried out by one class, this may have been a reflection of the limited understanding of the importance of whole school participation and having a united vision, which is considered an important aspect of a whole school approach to EfS (Enviroschools, 2014). It also indicates a lack of clarity between ‘tokenistic’ and ‘true’ children’s participation (Hart, 1997). This finding presents information that draws from both the ‘programmes’ aspect of a whole school approach where students are learning from examining the sustainability of their own school with the intent of taking action, and ‘people’, where the whole school has a vision of a sustainable future.

Summary

During this early implementation stage, some teachers viewed teaching EfS as a separate ‘unit’ to be added onto the curriculum rather than integrated through the curriculum. The EfS Facilitator visited each of the classrooms and spent some time modelling to the teachers different ways to lead student thinking and participation through facilitation and guided inquiry. During the implementation stage the school’s EfS programme appeared to be focusing on building student knowledge and understanding within a limited domain i.e. science, while other key concepts surrounding sustainability, such as equity, interdependence and responsibility for action were not apparent. The practicalities of involving all the students in the production of a whole school vision map appeared to present difficulties for the staff. The support provided by the EfS Facilitator appeared to be aimed at helping teachers to translate knowledge of the vision map theory into practice.

8.2.2.3 Practices

The findings of this research during the implementation stage of the development of the whole school approach to EfS emerging from the ‘practices’ aspect only touched briefly on the monitoring of sustainable practices within the school. The EfS Facilitator had suggested involving the students in a school-wide research project, such as monitoring waste management processes, and then students could present their findings to the school. In response to this, the principal had

mentioned said that while she wanted this to be student-initiated, she was concerned that the school could not always engage in *whole school* consultation, and that there were some things that the staff just had to ‘get on with’. This presented a conflict which appeared to be underlying much of the implementation of the whole school approach, i.e. the tension between the principal understanding the need for student driven EfS related tasks, which, by necessity occurs relatively slowly, and pressures to integrate EfS at a ‘faster’ speed. Monitoring sustainable practices within the school is an important aspect within the ‘Practices’ aspect of a whole school approach and can assist in the implementation of the whole school approach. Making decisions with, or driven by, the students is also a key aspect of ‘People’, and can also assist in the implementation of the whole school approach (Enviroschools, 2016). The staff at Ryelands School appeared to be aware of the need for sustainable practices to be in place, and the importance of student participation in this, but they were still to be implemented at the time of this study.

8.2.2.4 Place

The findings of this research during the implementation stage of the development of the whole school approach to EfS emerging from the ‘place’ aspect touched briefly on one key concept of a whole school approach to EfS: that the school grounds are a learning place (Enviroschools, 2016). There were indications that the school was in the early stages of recognising that the grounds were a learning resource for student action where students could design and re-create their learning place, for example, developing school gardens. It appeared that each class was working in isolation from each other with respect to tasks such as garden designs, contrary to the recommendations of a whole school approach which requires that the *whole* school participates in EfS tasks.

8.2.2.5 Enablers and inhibitors to the implementation of the whole school approach to EfS

Key enablers that were identified during the implementation of the whole school approach to EfS included:

- Facilitator modelling EfS in practice
- Student-centred learning approaches
- Students participating in monitoring sustainable practices in school
- A rudimentary understanding of the nature of ‘People (and Participation)’ ‘Programmes’, ‘Practices’ and ‘Place’
- Developing students’ knowledge and understanding, and attitudes and values around sustainability.

These enabling factors contributed to the school’s implementation of a whole school approach to EfS by addressing a number of key aspects of a whole school approach to EfS (Enviroschools 2016; Henderson & Tilbury, 2004; MoE, 1999; Shallcross, 2006), e.g. school ethos and culture, student participation in EfS tasks, developing student knowledge and understanding, and attitudes and values around sustainability. These enabling factors indicated some knowledge of the elements of a whole school approach to EfS was understood by the staff of the school. This may relate to the actions of the EfS facilitator in guiding the ability of the staff through the process of integrate effective EfS (Rickinson et al., 2015).

Key inhibitors that were identified during the implementation of the whole school approach to EfS included:

- Limited staff understanding of the depth and breadth of the concept of sustainability and EfS
- A lack of staff (including principal) prioritisation of EfS, in part indicated by lack of consistent full staff attendance at all EfS Facilitator led sessions
- Teachers providing limited scaffolding to support and develop student knowledge around sustainability
- Teachers view EfS as a separate ‘topic’ to be studied
- Whole school not involved in EfS

These inhibiting factors were identified as they indicated elements of a whole school approach that are considered key in successful implementation

(Enviroschools, 2016; Henderson & Tilbury, 2004) but were not apparent in the study school. These inhibiting factors may not have been present, in part due to the nature of the EfS facilitation and the nature of the school leadership, both of which have a key part to play in the successful implementation of a whole school approach to EfS (Prain & Hand, 2003; Bolstad et al., 2015). While the EfS facilitation and school leadership may likely be the origins of enabling factors, such as those mentioned above, the identification of the inhibiting factors indicate that perhaps some aspects of facilitation or leadership may have benefited from a different approach.

8.2.3 Response to Question 3 - What were the outcomes of the whole school approach to education for sustainability in terms of student learning, teacher development and school change?

Four key areas of schooling life that have an effect on sustainability and student learning are People and Participation, the Programmes, the Practices, and the Place (Enviroschools, 2016). The following findings emerged from the third research question under these four points.

8.2.3.1 People

The findings of this research during the outcomes stage of the development of the whole school approach to EfS emerging from the ‘people’ aspect include themes of: student understanding of the whole school vision map, student understanding of EfS, issue of teacher understanding, EfS and school leadership.

Student understanding of the whole school vision map

The whole school vision map only involved the students from one class of Year 5 and Year 6 students at Ryelands School. The students appeared to be unsure of how the vision map connected to any EfS tasks they had been involved in during the year, and seemed unsure of its ultimate purpose. The limited outcomes in terms of student understanding indicated that the students did not yet understand the function of the task in great depth, i.e. that it was a working document

whereby all members of the school community have the opportunity to contribute and a platform from which all participants can take action to create a sustainable school (Enviroschools, 2016).

Student understanding of EfS

Students appeared to be struggling to understand the complexity of sustainability: a common theme across the student responses was the idea that sustainability was ‘about things lasting a long time’ and ‘using fewer resources’. While the concept of using fewer resources is a key aspect of sustainability, students did not display any understanding of any other aspect of EfS, such as it being action-oriented, issues based, or holistic in nature (Enviroschools, 2016; MoE, 2017; Tilbury, 1995).

Almost a year after the school had finished its first year of EfS integration, the staff responded in a written focus group session that they felt that the students’ understanding of the concept of sustainability had not changed, as there had been no emphasis on sustainability in their teaching and that they hadn’t reinforced it. This lack of reinforcement of sustainability by the staff during the year coincided with the absence of the EfS Facilitator in the school during that year. The lack of teacher support through professional learning sessions with the EfS Facilitator may have been related to the apparent decline in EfS teaching and practice within the school. It has been argued that teacher support in EfS needs to be an ongoing presence at a variety of levels, at the ‘grassroots’ level, where there are challenges of insufficient teacher knowledge and a need for training opportunities; and where there are possible conceptual barriers to teaching EfS, causing conflicts to arise between sustainability education theory, school practices and student learning (Dyment & Hill, 2015).

Students had indicated that they thought it was ‘everyone’s’ job to look after their environment. The students were, in effect, describing a key idea within the ‘People’ aspect of a whole school approach to EfS where there is an aim to create a sense of belonging and ownership in the school community (Enviroschools, 2014). If the school community becomes involved in caring for the school

environment that they belong to, they are more likely to develop a sense of guardianship for that environment (MoE, 2017). Data collected approximately two years after the school's EfS journey began indicated that students had been involved in some school decision-making, which supports a whole school approach to EfS (Henderson & Tilbury, 2004).

Issue of teacher understanding of EfS and school leadership

The teachers' opinions on any possible changes to their understanding of EfS during the outcomes stage of the whole school approach to EfS varied: one felt it had remained much the same during the first year of the whole school approach to EfS, whilst another thought she now thought that she had a greater understanding of what sustainability was and how it could be linked to education. It coincided that the teacher who felt the most change in understanding was also the individual who had attended the most professional learning sessions with the EfS Facilitator, possibly suggesting a connection between the sessions and teacher learning outcomes. Approximately a further year after finishing the first year of integrating EfS into the school, the teachers responded in a focus group that their understanding had not changed because it had not been reinforced with any professional development sessions, as their EfS Facilitator had stopped visiting the school.

It was not clear, during this outcomes stage, if the school principal was providing the support necessary for supporting school-wide change. In particular, the EfS Facilitator had expressed concerns about the role of the principal in the provision of support with respect to (a) the development of collaborative working relationships across the school; and (b) supporting the involvement of staff in professional development with respect to EfS. Leadership is key to managing successful change towards a pedagogy of EfS (Fullan, 2001; Prain & Hand, 2003). The principal's role developing a whole school approach through all stages of EfS integration needs to be one that challenges the existing paradigm within their own learning community, and supports whole school transformation towards sustainability: in teaching and learning and the curriculum; in their leadership of the school as an organisation; and in their relations with the wider

community (Carr, 2016; Prain & Hand, 2003). It was not clear that the principal of Ryelands school was providing the support needed to develop teachers' understanding of EfS.

Summary

The limited outcomes in terms of student understanding around the whole school vision map indicated that the students did not, at that time, understand the function of the task in great depth. The concept of using fewer resources was a key aspect of sustainability that the students seemed to have the greatest understanding of, and they did not display any understanding of any other aspect of EfS, such as it being action-oriented, issues-based, or holistic in nature. The lack of teacher support through professional learning sessions with the EfS Facilitator may have been related to the apparent decline in EfS teaching and practice within the school over time. It was not clear, during this outcomes stage, if the school Principal was providing the support necessary for supporting school-wide change.

8.2.3.2 Programmes

The findings of this research during the outcomes stage of the development of the whole school approach to EfS emerging from the 'programmes' aspect include themes of teacher perception of student learning around EfS and teacher professional learning.

Teacher perception of student learning around EfS

Two of the staff members thought that their students were a lot more interested in what they were learning because their learning was driven by their own curiosity. They considered that their students had changed in their understanding of the concept of sustainability over the year because they were able to talk more about their learning and why they were learning it. It is possible that the student-centred teaching and learning approaches that the teachers incorporated during their EfS programmes, which included inquiry-based learning and discovery learning, may

have motivated the students' ownership of, and interest in learning about EfS (Eames, Wilson-Hill & Barker, 2013; EnviroSchools, 2016). This in turn may have had a positive influence on the students' learning in EfS. One year after finishing the first year of the whole school approach to EfS, the teachers reported that student-centred learning approaches were being used, although they did not specify if they were being used to support learning in EfS.

Teacher Professional Learning

During the year that the staff had been working without the assistance of the EfS Facilitator, their progress of EfS integration waned as sustainability appeared to be playing a background role in the schools' programmes. This lack of teacher professional learning support in EfS may have presented challenges where there may have already been low levels of teacher knowledge (Dyment & Hill, 2015).

Summary

The student-centred teaching and learning approaches that the teachers incorporated during their EfS programmes, which included inquiry-based learning and discovery learning, may have motivated the students' ownership of, and interest in, learning about EfS. The lack of teacher professional learning support in EfS in the second year of their EfS integration may have presented challenges due to pre-existing low levels of teacher knowledge.

8.2.3.3 Practices

During the outcomes stage of the whole school approach the students showed attitudes and values relating to care and concern for the environment. This appeared to revolve around anthropocentric views of the world, as they disapproved of aspects of the environment that they considered dirty, untidy, 'old', inconvenient and ugly, and preferred areas that they considered attractive, tidy, fun, and comfortable. The students were enthusiastic about waste minimisation practices both towards the end of the first year of EfS integration and roughly two years after starting their whole school approach to EfS. The

identification of, and student action around, local issues such as waste minimisation is a key aspect of EfS (MoE, 2017; Tilbury, 1995). Waste minimisation is one of the practices that a school can engage in which supports the whole school approach to EfS (Enviroschools, 2014).

Earlier in the study, during the planning stage, the teachers had indicated that they were keen to instil attitudes and values of care and concern for the environment, which are key factors in the development of a whole school approach to EfS (MoE, 1999; Tilbury, 1999). It was unclear from the study whether the students were keen to see their school become clean and tidy because they were constructing new ways of thinking about their school environment from the EfS tasks they had been involved in (Ballantyne & Packer, 2005; Gough, 1997), or because they were responding to values of cleanliness and tidiness that were likely instilled in them in their home and general school lives.

8.2.3.4 Place

During the outcomes stage of the whole school approach to EfS, students expressed an understanding that the ‘health’ of the environment was important to their own survival, and that of other animals such as birds. It was unclear if these ideas were an outcome of the teaching and learning in EfS that they had been involved in during the year. Nevertheless, this understanding is a key aspect of ‘Place’, which describes how school grounds can demonstrate how ecosystems work and provide students with opportunities for experiencing an interconnection with nature (Enviroschools, 2014), and is an important aspect of a school modelling sustainability (Henderson & Tilbury, 2004).

8.2.3.5 Enablers and inhibitors to the outcomes of the whole school approach to EfS

Key enablers that were identified during the outcomes of the whole school approach to EfS included:

- Students consider environment to be everyone’s job to look after

- Students have some role in school decision-making
- Some resources are present in classes to help students understand concept of sustainability
- Professional development and learning with the EfS Facilitator
- EfS tasks are engaging for students
- Students showing attitudes and values of concern and care for the environment
- Teachers considered there to be some staff cohesion present
- Waste minimisation occurring in school

These enabling factors allowed the school to develop a degree of orientation towards sustainability, i.e, the students were showing attitudes and values of care towards their environment, student-centred learning was occurring, and student involvement was apparent in EfS tasks and practices. These are factors which are recognised as contributing to a successful whole school approach to EfS (Enviroschools, 2016; Henderson & Tilbury, 2004). These factors likely indicate that the guided support of the EfS facilitator had allowed the staff some degree of capacity to translate EfS theory into practice (Tilbury & Wortman, 2005).

Key inhibitors that were identified during the outcomes of the whole school approach to EfS included:

- School vision map not fully understood by students
- Principal not prioritising EfS or making provision for regular full staff professional development and learning in EfS
- Students did not appear to understand depth of knowledge around sustainability
- Lack of EfS facilitation over time not keeping EfS a strong presence in school
- Teachers apparent lack of deep understanding of the nature of sustainability and how to implement EfS appeared to be affecting student learning outcomes

These inhibiting factors did not allow students to develop a deep and broad understanding of EfS, or provide an opportunity for ‘whole school’ integration of EfS (Enviroschools, 2016; Henderdon & Tilbury, 2004). The presence of these inhibiting factors may relate to the nature of the EfS facilitation and school leadership. Specifically, while the EfS facilitation appeared to provide some support for the staff, it may have failed to emancipate the staff by giving them the ability to independently translate the full breadth of EfS theory into practice (Wals & Jickling, 2002), i.e. the provision of a structured framework with which to guide their actions (Rickinson et al., 2015). The school did not appear, during this phase, to possess the ability to internally monitor their EfS progress or to externally verify why their work was important (Rickinson et al., 2015) which may have inhibited their progress. While it was not clear what a possible ‘cause’ for this apparent lack of ability may have been, stronger school leadership for change, specifically greater priority placed on EfS, may have lead to more effective sustainable change in the school (Prain & Hand, 2003 Simovska & Prosch, 2016).

8.3 Limitations of the study

The data collection in this study was limited to one primary school in New Zealand. While this allowed for an in-depth case study to be investigated, it raises the issue of transferability, i.e. whether the results can be generalised to the wider population, and other cases, settings, times or situations. In spite of the study focusing on one school only and their EfS journey, I believe that the overall study design has validity because it was a study of themes that were drawn during the integration process, as opposed to a study of particular individuals. The methods that were used to study the schools development of a whole school approach to EfS could equally be applied to any given primary school integrating EfS, and the themes subsequently presented.

Time pressures on staff and teaching time meant that it was not possible to conduct data collection sessions such as interviews with, or questionnaires from, teachers and more than, on average, twice a year. This meant that it was sometimes difficult to obtain follow up data with the same individuals over the

course of the year. Challenges to observing the EfS Facilitator sessions with the teachers, and also classroom observations, included unreliable information from the staff regarding the times of the sessions, which meant that it was sometimes difficult to get a clear picture of the order of events taking place in the school. However, although I was not able to be in the classes all the time and observe everything that was happening, I am confident that I managed to get a strong overall picture of the EfS integration process.

When examining the data it was not always clear how much actual understanding the teachers had in terms of sustainability and EfS. At times it appeared to me as the researcher that some staff were crediting themselves with higher knowledge than they had, and vice versa, but I felt that it was, at times, difficult to see this clearly in the data. The possibility of differences between perceived versus actual behaviour can create limitations in research of this nature. Retrospectively, I considered that the questions for the staff regarding their understanding of EfS may have been more beneficial if they had been more specific with respect to more detailed aspects of EfS, in order to determine more clearly what the teachers actually knew about EfS. EfS is a complex idea to comprehend and can also be difficult to explain to others, and providing greater scaffolding of ideas in the interviews and questionnaires may have produced more detailed data.

8.4 Conclusions and implications

A number of conclusions and implications can be drawn from this study into the initiation and early stages of development of a whole school approach to EfS in a primary school. These conclusions are given below, within the three stages of development, i.e. the planning stage, the implementation stage, and the outcomes stage. These are each further divided into four sections, outlining the four aspects of a whole school approach to EfS, i.e. 'People (and Participation)', 'Programmes', 'Planning', and 'Place'.

8.4.1 Planning a whole school approach to EfS

People

The school leaders' understanding of, and motivation to integrate EfS may have an effect on their ability to lead the school through the process of change towards that of sustainability. Teachers' views and understanding of EfS may impact upon their planning and ability to perceive how EfS can be integrated into the whole school system. The sense of school community ownership and commitment to EfS may have had an effect on the degree to which the whole school community felt motivated to integrate EfS into the whole school systems. It is this whole school involvement and sense of ownership which is key to sustaining change.

Programmes

The irregular presence of all the staff at the Professional Learning meetings with the EfS Facilitator may have had a negative impact upon the teachers' ability to integrate EfS into their educational programmes. This low attendance rate may have been an indicator of the level of commitment to, and value of EfS that the teachers placed on integrating it into their teaching and learning programmes. During the planning stage, the teachers appeared to perceive EfS as a 'nature study', and thus the development of students' knowledge and understanding of basic biological concepts and the natural environment, and attitudes and values of environmental care figured prominently. It seems likely that because the teachers did not appear to understand the wider context of sustainability, they struggled with transdisciplinary approaches to EfS and the curriculum during the planning stage. The teachers at Ryelands School appeared to understand that teaching approaches such as problem-solving and 'hands-on' learning and inquiry-type learning would be useful in delivering EfS. The interface between EfS theory and practice was a source of concern for the teachers in areas such as student participation in planning their learning. The EfS assessment methods that were suggested during the planning stage indicated an understanding of the need to reflect upon change which is a key aspect of EfS.

Practices

The school staff recognised the importance of waste minimisation, wise use of energy, composting of food waste, and care of water resources. The staff also understood that these practices needed to be monitored over time, with progress being made towards sustainability. It is possible that the staff saw greater importance in planning the school teaching and learning programmes as these practices-related concepts did not figure greatly in the planning stage of the whole school approach to EfS. It may also be that the knowledge and understanding of EfS on the part of the school leaders and staff inhibited them from recognising the value of including school practices in a whole school approach to EfS.

Place

During the planning stage of the whole school approach to EfS, the teaching staff were restricted in their views of ‘place’ to the external environment only (i.e. the native bush section of the grounds), and how this could be developed for student learning about sustainability. The educational possibilities presented by school buildings and how they could be developed and utilised to assist in learning about sustainability did not appear to be recognised by staff at this stage. As for ‘Practices’ above, the knowledge and understanding of EfS on the part of the school leaders and staff may have inhibited them from recognising the value of including the school buildings and grounds in a whole school approach to EfS.

Implications for planning a whole school approach to EfS

The research presents several implications to be considered during the planning stage of a whole school approach to EfS in a primary school:

1. That the school leaders’ knowledge and understanding of EfS impacts upon the entire school community’s involvement in EfS planning.

2. That the principal's knowledge and understanding of effective whole school innovation with respect to EfS may affect the ease of the integration during the planning stage.
3. That the knowledge and understanding of EfS on the part of the teachers affects how, where and the degree to which they integrate EfS into the curriculum.
4. The interface between EfS theory and practice needs to be closely addressed in order to assist teachers in implementing EfS into the classroom.
5. The knowledge and understanding of EfS on the part of the school leaders and teaching staff also affects the degree of integration of EfS into school-wide systems and practices, and the how the school is viewed in terms of sustainability.

8.4.2 Implementing a whole school approach to EfS

People

As has been described in the 'People' section above, the teachers' varying levels of understanding of EfS may have influenced what they taught their students and how they perceived their learning. There were few professional learning experiences that all the staff received. The staff seemed to also be generally unsure of what direction they were taking in terms of integrating EfS into the whole school system. Developing staff cohesion and participant ownership, including student participation, had been proving difficult at Ryelands school. The school leaders knowledge and understanding of EfS and a whole-school systems approach to change, and the importance of provision of strong support plans may have impacted upon the teachers' sense of purpose and direction regarding how to implement a whole school approach. It may also have affected staff cohesion and participant ownership of the change towards sustainability.

Programmes

The teachers appeared to be focusing on building student knowledge and understanding mainly from a ‘science and nature’ perspective during the implementation of the EfS programmes. It may have been useful if the teachers had received increased support and professional learning around how to integrate the wider context of EfS, for example, how to integrate concepts such as equity, interdependence and responsibility for action into the school programmes. While the support provided by the EfS Facilitator appeared to be aimed at helping teachers to translate knowledge EfS theory into practice, this did not appear to be providing the level of support that the teachers needed to integrate the broader nature of EfS into their programmes. The nature and frequency of the EfS Facilitation may have an effect on the teachers understanding and ability actively integrate a greater range of aspects of EfS.

Practices

While the staff at Ryelands School appeared to be aware of the need for sustainable practices to be in place, there appeared to be a limited understanding of the importance of EfS practices being inherent in all ‘real world’ issues that pertain to school life, and of the contribution that these practices would make to the school environment and its community.

Place

While there were early indications that the school was in the early stages of recognising that the grounds were a learning resource for student action the staff did not yet appear to be recognising the part that the school building and grounds had to play in a whole school approach to EfS. This may stem from their limited understanding of EfS at that time.

Implications for implementing a whole school approach to EfS

The research presents several implications to be considered during the implementation stage of a whole school approach to EfS in a primary school:

1. That the school leader(s) have an important role to play in the guidance of the schools' implementation of EfS, specifically with respect to helping to support teachers and the school community in maintaining focus and direction.
2. That teachers' EfS knowledge and understanding on what EfS actually is affects the way in which it is planned and integrated into the school programmes.
3. Specific support for teachers and school leaders regarding the application of EfS theory into practice is required to help embed a whole school approach to EfS.

8.4.3 Outcomes of a whole school approach to EfS

People

The students were limited in their understanding of sustainability and did not display a broad understanding of sustainability. The limited understanding of EfS displayed by the students was likely to have been related to the observation that the teachers also had a limited understanding of the complexity of EfS. The provision of support with respect to supporting the involvement of staff in professional development in EfS appears to have impacted upon the students' EfS learning outcomes. The lack of teacher support in the form of professional learning sessions with the EfS Facilitator may have been related to the apparent decline in EfS teaching and practice within the school over time.

Programmes

The student-centred teaching and learning approaches that the teachers incorporated into their EfS teaching tasks may have motivated the students' ownership of, and interest in learning about EfS. The lack in teacher support in EfS in the second year of their EfS integration may have presented challenges to developing successfully integrated EfS programmes where there were possibly already issues of insufficient teacher knowledge.

Practices

Students considered practices that produced a clean and tidy environment to be important. Whilst this demonstrates a commitment of care for the environment, EfS practices may have benefited from further support regarding methods with which to embed EfS practices into the *whole school* community.

Place

Students expressed an understanding that the 'health' of the environment was important to their own survival, and that of other living things. They also placed value in their grounds being clean and tidy. It was unclear from the study whether these values of cleanliness and tidiness arose from the construction of new ways of thinking about their school environment from the EfS tasks they had been involved in; or whether they were responding to values of cleanliness and tidiness that were likely instilled in them in their home and general school lives. Whilst the ideas of a healthy environment and a clean/tidy environment are relevant to EfS in terms of reduced pollution and waste, this may have broader implications for tasks such as design of the grounds where conflicts of values may promote tidy, manicured gardens, over complex, 'messy' ecosystems that supports life, such as 'wild areas'

Implications for the outcomes of a whole school approach to EfS

The research presents several implications to be considered during the outcomes stage of a whole school approach to EfS in a primary school:

1. That the depth of knowledge and understanding of EfS learning outcomes demonstrated by students is affected by the depth of EfS knowledge and understanding demonstrated by the teachers.
2. That teacher knowledge and understanding of the transdisciplinary nature and the wider context of EfS impacts upon the integration of EfS into their teaching programmes and the subsequent student learning outcomes.
3. That the school leaders have a key role to play in providing strong implementation plans to support a school-wide innovation, including effective, sustained teacher professional learning experiences in EfS, and a culture of teaching collegiality and ownership.
4. That the nature of the EfS facilitation has an effect on the teachers' and school leaders' ability to successfully integrate the broader aspects of EfS into the learning programmes (i.e. their resilience with respect to EfS), which in turn affects student learning outcomes.

8.5 Suggestions for practice and further research

This study has contributed to the understanding of the development of a whole school approach to EfS in a New Zealand primary school. The implications for practice are:

1. Professional learning surrounding leadership for change towards a culture of EfS may be required by the school principal and school leaders prior to initiating a whole school approach to EfS.
2. That EfS Facilitation for teachers and school leaders needs to pay particular attention to highlighting and clarifying the transdisciplinary nature and wider context of EfS.
3. That teachers and school leaders need particular support and clarity regarding the interface between EfS theory and practice, specifically how to practically integrate and implement it with respect to the participation of the school's 'people', teaching and learning programmes, practices and physical place in the environment.

The potential for further research is outlined below:

- The examination of motivating factors for school leaders in EfS. The question arises regarding what motivates a school leader to pro-actively integrate EfS into a (primary) school. Can this motivation for change be enhanced and sustained?
- How can the interface between theoretical knowledge about implementing a whole school approach to EFS and the practical implementation be further improved, i.e. what are the different ways that EfS can be externally facilitated to enable teachers to integrate EFS with greater confidence and skill?
- How does the nature of EfS Facilitation affect the teachers' and school leaders' practical implementation of EfS in the classroom?

- How can EfS be made more accessible to *all* the students in a primary school? One of the challenges that the teachers seemed to face was making the complexity of EfS understandable to young children (i.e. 5 to 7 year olds). This suggests that additional research could be carried out in order to ascertain ways in which teachers of junior school students can make the complex subject of sustainability accessible to young children.
- As an extension of the above comment, it may be useful to develop and test the efficacy of ‘tailor-made’ literacy and numeracy educational resources that have sustainability embedded in them, specifically targeted at junior school students. This may allow teachers to fulfil their literacy and numeracy classroom requirements, with embedded meanings that pertain to sustainability.

One of the most important purposes for society is to equip children with the attitudes, values, knowledge and skills necessary to rethink and change current patterns of action and to secure healthy and sustainable futures for all. Education for sustainability is important and has a critical role in this.

(Erturk, Aydos & Aydin, 2015)

Appendix 1

Inquiry, co-operative and experiential learning framework

Inquiry, Co-operative , Experiential learning.

| Education for Sustainability is cross-curricula. Developing Understandings: | | |
|--|---|--|
| Young people will be confident, connected, actively involved, lifelong learners | | |
| What is it we want for our young people? What do we want the students to understand? | What is it we want them to be able to do? | What is it that we want them to be? |
| <p>Understandings of the world:</p> <p>These learning areas deal with rich life experiences that drive effective learning</p> <p>Social sciences. Science. <i>Some aspects of technology.</i> Health. <i>Some aspects of Physical Education.</i> <i>-and the ways of thinking and working relevant to each.</i> <i>Use 1/2 of these ...</i></p> | <p>Key Competencies:</p> <p>These indicate ways of working.</p> <p>Thinking. Using language, symbols and text. Managing self. Relating to others. Participating and contributing. <i>- by which students make sense of their learning.</i> <i>Use all of these ...</i></p> | <p>Contexts for learning:</p> <p>Through these learning areas students come to make sense of their world.</p> <p>English. Maths. The Arts. Learning Languages. ICT. <i>- through which they can access, process and communicate.</i> <i>Use several of these ... not necessarily all.</i></p> |
| <p>Values:</p> <p>Excellence Ecological sustainability. Equity. Integrity. Action: Is there a major task/event/action that students may undertake towards the end of the unit that will demonstrate understandings and allow them to apply what they have learned? Will it have an authentic purpose/audience?</p> | <p>Principles:</p> <p>High Expectations. Cultural Diversity. Community Engagement. Inclusion Resources: Can we draw on expertise from the community? What excursions, materials (books, CDs, charts etc), texts are available?</p> | <p>Treaty of Waitangi. Learning to Learn. Future Focus. Coherence</p> |

Beryl Oppert 2008

Adapted from model from 'Classroom Connections. Strategies for Integrated Learning' – Kath Murdoch 2004

Appendix 2

Education for sustainability: whole school focus

| Education For Sustainability | |
|---|--|
| Whole School Focus | Term 1, 2009 |
| Broad (Global) Understanding: Everybody has a part to play in sustaining our environment for future generations. | |
| Key Questions: (Refer activities below to compliment questions) | |
| <ol style="list-style-type: none"> 1. What is sustainability? 2. What is an environment? 3. Why do we need to create a sustainable environment? 4. How can we each play our part in creating a sustainable environment? | |
| Values: | |
| Ecological Sustainability - <i>Care for the environment.</i> | |
| <i>Our needs and wants... Renewable/non-renewable resources...</i> | |
| Diversity - <i>Maori perspective and use of resources.</i> | |
| <i>Western world driven by money...</i> | |
| <i>Some communities picking from rubbish dumps...</i> | |
| Community and Participation - <i>Working together for the common good.</i> | |
| Key Competencies. | |
| Thinking | |
| Managing Self | |
| Relating to Others | |
| Participating and Contributing. | |
| Our World's Environment... | |
| Front Loading Activities: | Understanding: |
| 1. <i>Think of some practical activities that explain sustainability....</i> | |
| 1. Global Village' story Papatuanuka and Ranginui and their sons (Atua) 'Ping' (Chinese) | Different cultures use the environment differently (Diversity) |
| 2. 'The World as an Apple' 3. 'Stress on the World' (Balloon) | The Earth's resources need to be sustained. |
| 4. Brainstorm initial ideas Journal stories Starfish Story 'One Child' story | Each person can make a difference but collectively we can make a sustainable difference. |
| Our Local Environment... | |
| How can we reduce our impact in our local environment? | |
| Whole School | |
| People | |

Appendix 3

Planning an integrated inquiry: guide and proforma

Planning an Integrated Inquiry: guide and proforma

| | |
|-------------|---------------|
| Unit Title: | Big question: |
|-------------|---------------|

| |
|---------------------|
| Host Area/Essential |
|---------------------|

| | |
|-------------------------------|------------------------------------|
| Year Level/student group:.... | Proposed Duration of Unit:.. Weeks |
|-------------------------------|------------------------------------|

| |
|--|
| Planned by _____ |
| Why This Unit? What global questions/issues does it connect with? How is it relevant to our students' lives? How might this unit help make a difference to their lives or the lives of others? Why is this worth doing? |

| | |
|---|--|
| Understandings What do we hope students will <i>understand</i> by the end of this unit? What transferable, robust, 'big ideas' will they gain? What is important and relevant for these students? | |
| Key Concepts/questions (universal concepts that will be revisited in other units) | |

| Social / Collaborative skills | Communication skills | Inquiry / research skills | Reflection and self management skills |
|-------------------------------|----------------------|---------------------------|---------------------------------------|
| | | | |

| | |
|--|--|
| <p>Key Resources (reflecting understandings)</p> <p>Do we know any experts in the area? Can we draw on expertise within our community?</p> <p>What excursions are available?</p> <p>What materials are available to us? (books, CD ROM, videos, charts etc)</p> <p>What are some of the texts that are likely to be drawn on in this unit?</p> | |
| <p>End-of-unit action/performance task</p> <p>Is there a major task/event/action that students may undertake towards the end of the unit that will <i>demonstrate understanding</i> and allow them to link 'theory' to practice?</p> <p>How will this proposed task need to be prepared for?</p> | |
| <p>Tuning In</p> <p>How can we engage students in this topic?</p> <p>What can we do to spark interest/enthusiasm/curiosity/motivation?</p> <p>Should we set the scene by introducing an authentic issue or problem? Share literature or use narrative? Use visual texts? Drama?</p> <p>How can we assess students' prior knowledge, values and experience in relation to the understandings?</p> <p>How can we involve students in negotiating the direction of the unit and setting goals?</p> | |

| Finding out: What experiences/resources/ activities could be used to assist students to gather information in relation to our planned understandings | Sorting out How can we help students <i>make sense</i> of the data they have gathered? How will they process, sort out and organise their ideas? (arts, maths, English, technology) |
|--|---|
| | |

| | |
|--|--|
| <p>Drawing Conclusions How can we assist students to pull it all together and reflect on their learning.</p> <p>How will we ask students to articulate their new UNDERSTANDING of the topic?</p> <p>How can we encourage higher order thinking (synthesis evaluation)</p> <p>How can we help them self assess?</p> | |
| <p>Going Further/ Pathways and possibilities How can we further students' experience and understanding about this topic? How can we challenge their ideas and give them new perspectives? How can we cater for individual and small group pathways as they emerge during the unit?</p> | |
| <p>Reflection and Action: How can we empower students to act on what they have learnt?</p> <p>Is there a rich, authentic task (preferably one that integrates a range of skills and processes) that will help give the unit real purpose?</p> <p>How will kids 'show what they know'</p> | |

Appendix 4

Education for sustainability planning sheet: planning an integrated inquiry

**Education for Sustainability Planning Sheet.
Planning An Integrated Inquiry.
School – Our Environment**

| | |
|--|--|
| Student level: | Whole school |
| Planned by: | |
| Global Understanding: | Everybody has a part to play in sustaining our environment for future generations. |
| Proposed Inquiry Question: | How can we all care for School? |
| Major Curriculum Areas: | Social Sciences Science |
| Why This Unit? How is it relevant to our students' lives? Why is this worth doing? For the children to | <ul style="list-style-type: none"> • Develop an awareness of and responsibility for the environment – school, national and global • Realise our actions on the environment now will impact the school and community forever • Engage in positive action – direct or indirect – that will sustain the environment <p>"We are the keepers of School"</p> |
| Understandings: (3-5) What do we hope the students will understand by the end of the unit? What is important and relevant for these students? Do these understandings assist students to develop the 'Big Ideas' | <p>The environment needs to be sustained for future generations The environment can effect our feelings, moods and attitudes Everyone can make a difference Our actions can have an impact (negative or positive) on people and places</p> <p>'A little step is better than no step at all'.</p> |
| Principles: | <p>Community Engagement Cultural Diversity Future Focus</p> |

| | |
|---|--|
| <p>Values:</p> <p>Ecological Sustainability - Care for the environment. Our needs and wants (greeds). "Diversity is the key to unity". Maori (cultural) perspective and use of resources. Western world drive for money – materialism / consumerism Diverse needs (some communities picking from rubbish dumps) Working together for the common good</p> <p>Diversity - Community and participation - Innovation, inquiry and curiosity.</p> | |
| <p>Key Competencies: Managing Self</p> <p>Self motivation and a "can-do" attitude Acting independently Interacting effectively with a diverse range of people <i>How do different cultures protect, use the land?</i> Co-operating</p> | |
| <p>Relating to Others.</p> <p>Seeking and using knowledge Asking questions and problem solving Reflecting on past actions</p> | |
| <p>Thinking.</p> <p>Being actively involved Contributing to action for the environment Making meaning of environmental language Conveying sustainable messages – signs, maps, plans, big ideas...</p> | |
| <p>Participating and Contributing</p> <p>Using Language, symbols and texts.</p> | |
| <p>Relevant concepts of Education for Sustainability. <i>Guidelines for Environmental Education in NZ Schools.</i> Aims: P9 Awareness and Sensitivity. Skills. Knowledge and Understanding. Attitudes and values. Participation and Action.</p> | <p>Key Concepts: P11 – 13. Sustainability. Interdependence. Biodiversity. Personal and social responsibility for action.</p> <p>Key Dimensions : P 14. Education 'in' the environment. First-hand experiences. Education 'about' the environment. Establishing attitudes and values. Education 'for' the environment. Making choices to improve the quality. Action.</p> |
| <p>Spheres of education for sustainability: Natural (Bio-physical). Economic.</p> | <p>Support systems for all life. Ways of producing and exchanging all goods and services.</p> |

| | |
|---|---|
| Social / Cultural. Political. | Rules / structures to enable people to live together. Decision making about using the environment. |
| Maori World View: | |
| "The concept of interdependence is reflected in the Maori world view. Maori regard themselves as a product of the union of Ranginui, the Sky Father, and Papatuananuku, the Earth Mother.. Maori belong to the land as <i>tangata whenua</i> and all things are united through the <i>mauri</i> ." | |
| " Sustainability is reflected in the notions of <i>hauora</i> and <i>rahui tapu</i> ." | |
| "The notion of responsibility is reflected in the Maori concept of <i>Kaitiakitanga</i> ." | |
| Tangata whenua. Mauri Hauora. Kaitiakitanga. Taonga. | All Maori people, local people of the land. Life force of all living things Health and well-being. Guardianship by people. Knowledge and practices associated with looking after the environment. (<i>Best left to / supported by local iwi</i>). Treasures, valuable assets, resources. Prized possessions, both material and non-material. |

| | |
|---|--|
| Key Resources: Do we know any experts in the area? What excursions are available? What materials are available to us? What are some of the texts likely to be drawn on? | The local environment Local identities – relate back to the recent Centennial. past photos of the school / district – what is the same / different? Centennial Booklet City Issues. Enviroschool Resources The Creation'– The story of 'Ranginui and Papatuanuku' – develops an understanding of the world view of their Atua (Gods) Stories from other cultures eg 'Ping'. Journal stories Story – 'The Global Village' 'Windows' - wordless text by Joy Baker National Library Local and school libraries |
| Possible Action / Performance Task: Is there a major task / event that students may undertake towards the end of the unit that will demonstrate and allow them to apply what they have learned? | Action for enhancement of the environment identified from the vision map. |

| | |
|--|---|
| <p>Aim for an authentic purpose / audiences and an integrated rich task.</p> | |
| <p>Assessment FOR Learning: (throughout the unit). What evidence of learning might we gather?</p> | <p>Photos before and after. Story board. Learning Journal. Class scrapbooks. Vision Map. Timeline</p> |

All the work prior to this is overview planning – it is essential that this is done well to allow the unit to flow and take it's own direction.

This is multi-level planning so will need to be adapted to the level of the students.

The focus for term 1 will be gaining a broad, global understanding of sustainability, and then developing awareness of their own home, school and community environment with the major focus being the school. A vision map will be developed for future planning and action. Input from all 'parties is important to get buy-in eg students, staff, BoT, PTA, parents

Following terms will focus in on a specific area eg waste management / recycling and specific sustainable practices and action projects, always relating it back to the global understanding and inquiry question.

It is important for both the teacher and student not to make the focus too broad.

*"The student must be kept at the heart of the leaning.
What do we want them to understand, do and be?"*

'Launch' the Unit.

'Tuning In:

- How can we spark interest in the topic?
- How can we assess students prior knowledge, values and experience in relation to the topic?
- How can we find out what they already think, feel and wonder about this?
- How can we give it an authentic purpose?
- How can we involve them in negotiating the direction of the unit and setting goals?
- How can we prompt questions and wonderings?

'Front loading' – practical activities that improve the understanding of 'sustainability'.
"The World is An Apple"
"Stress on the World"
"BINGO"
"The Starship" story.
"One Child".
Gathering prior knowledge – Concept Map
Brainstorming – anecdotes from other family members.

Week 4

Students can each make their own badges [redacted] can get badge maker but will need advance notification)

Display a large statement / global understanding in each classroom.

"Everybody has a part to play in sustaining our environment for future generations."

Display inquiry question in each classroom.

"How can we all care for [redacted] School"?

These will need to be adapted to the level of the students in each room.

What do we mean by all – who uses [redacted] School?
why and how do they use the school?
what might they like to see, hear?

Unpack vocabulary:

- environment.
- sustaining / sustainability.
- future generations.
- global
- issues
- resources

Evaluation of the 'Tuning In' Phase.

- What are our students revealing to us?
- What questions are arising at this stage?
- What misunderstandings have we observed?

| | |
|--|--|
| <p>How will we change our plans? What interests are apparent?</p> | |
| <p>Finding Out.</p> <p>What experiences, resources activities could be used to assist students to gather information in relation to our planned understandings?</p> <p>[See p 19 Enviroschools handbook] – 2nd quarter of the action cycle – “What are the alternatives”.</p> <p>Celebrating [redacted] School What are we doing now? What have we got now? Participate in environmental activities -word cards activities from ‘Me In My Environment’. sensory activities use De Bono’s Hats</p> <p>Collect data. Rubbish, water, power, transport, environment, buildings</p> <p>Use stories One Child. The Starfish story. Dinosaurs and All That Rubbish Windows Baker (No text) The Lorax (Can do a whole unit around this story)</p> <p>Visit other schools : what can they share with use?</p> | <p>Sorting Out.</p> <p>How can we help students make sense of the data they have gathered? How will they process, sort out and organize their ideas? (maths, english, arts, technology, ICT)</p> <p>‘We are the keepers (kaitiaki) of [redacted] School’ S - sustainable C - children. H – having O – ownership O – of L – learning</p> <p>Students could develop their own acronym.</p> <p>Develop school vision map Draw a large outline on material eg an old sheet Students add black and yellow hats.. Everyone to have input – students, staff, BoT, parents. Display this where it is visible to all.</p> <p>Analyse and record data. eg Feb 4 - We put out 4 wheelie bins of rubbish. We put these ??? actions into place April 4 We now only put out 2 wheelie bins</p> <p>Activities to develop thinking: Laying it on the Line. Agree / Disagree Diamond Ranking Scenarios</p> |

| | |
|---|---|
| <p>what sustainable practices do they have in place?</p> | <p>Action / Reason Cards</p> <p>Curriculum Language—writing stories keeping in a learn'g (double entry) journal Maths – measuring, graphing, sorting data Technology – making models / planning, designing, modifying eg bird feeders.</p> <p>IT -</p> |
| <p>Drawing Conclusions How can we assist students to pull it all together and reflect on their learning? How will we ask students to articulate their new understanding of the topic? How can we encourage higher order thinking? How can we help them self-assess.?</p> | <p>Jigsaw – Home and Expert Groups. Groups develop presentations to the whole class. share with other classes</p> |
| <p>Going Further. Pathways and Possibilities. How can we cater for individual and small group pathways as they emerge during the unit? How will we facilitate student's personal inquiries related to this topic? How can we encourage students to make choices about what and how they will learn?</p> | <p>Now that we have lots of new knowledge, what else might we want to find out? <i>(Personal lines of enquiry)</i> Developing 'fat' questions that lend themselves to inquiry.</p> |
| <p>Reflection. How can we empower students to act on what they have learnt?</p> | <p>(See 3rd quarter of the action learning cycle – Enviro-school Handbook).</p> |

How can we assist students to pull it all together and reflect on their learning? (During and at the end of the inquiry)
How can we encourage higher order thinking?
How can we help them self assess?

Action.

How might students act on what they have learned?

Each year / level class to identify an authentic issue and develop an appropriate plan of action – and action it
eg a notice for the oak tree
different gardens - reptile, sensory, edible
eating areas
recycling
using resources sustainably – eg energy, water
traffic / parking in front of the school
native area
creating a more welcoming entrance
murals and mosaics
student activities
gardens

B Oppert 2008. Adapted from Kath Murdoch.

Appendix 5

Formal interview schedule: Principal and lead EfS teacher

- 1) What do you understand by the term sustainability?
- 2) What do you understand by the concept of a whole school approach? Is it desirable for Ryelands School? If so, what would be your role in developing a whole school approach?
- 3) Where do you feel Ryelands School is currently at in terms of sustainability? Why do you think this is?
- 4) What is your vision for Ryelands School in terms of sustainability?
- 5) What are your expectations of your EfS facilitator?

People

- 6) Do you feel there is much collaboration across the school? Why or why not?
- 7) Do you feel the school currently reflects the cultural diversity of the school and its community, why or why not?
- 8) Do you feel the school acknowledges New Zealand's bicultural foundations, why or why not?
- 9) Do you feel there are any relationships between the school and the community with respect to the student's learning, why or why not?
- 10) Do you feel there is any consultation with the whole school community with respect to key decision making? Why or why not?
- 11) Do you feel that there is any action being taken within the school with respect to sustainability? Why or why not?
- 12) What part do you feel that the school leaders have in the development of a whole school approach to EfS at the school?
- 13) Have the staff had any professional development with respect to EfS? Do you feel this is necessary – why or why not?

- 14) Do you feel that there is recognition within the school as a whole of local, national and global sustainability issues – why or why not?
- 15) Has Ryelands celebrated any achievements it has had relating to EfS?

Programmes

- 16) At present, does Ryelands School have a whole school plan for EfS? Why or why not?
- 17) What teaching approaches do you feel would be useful in EfS? Why?
- 18) Whereabouts in the school do you think that EfS should take place and why?
- 19) In terms of the curriculum, how do you feel that EfS should be delivered?
- 20) What do you feel about assessment in EfS?

Practices

- 21) Do you feel that the school considers sustainability as a part of its budgeting and purchasing procedures? Why or why not?
- 22) Are there currently any organisational structures in place within the school to support a whole school approach to EfS?
- 23) Are there currently any school resources that you feel are being managed sustainably? (eg water, energy etc...) Why or why not?

Place

- 24) Do you feel that the school has a variety of natural environments for formal and informal learning? If so, what are these?
- 25) Do you feel that the school has a variety of natural environments in the school grounds that sustain people and ecosystems?
- 26) Do you feel that the existing school buildings reflect environmental or sustainable practices? Why or why not?

Appendix 6

Semi-structured interview schedule: Short interview for teachers

- 1) Do you feel your understanding of the term sustainability has changed since the beginning of the year? How? Why? (with respect to people, practices, programmes and place)
- 2)
 - a) Can you summarise what EfS related activities you have taught or been involved in to date?
 - b) Have your thoughts about how to teach EfS changed in any way since starting the whole school approach this year? How? Why?
 - c) How do you feel the students have responded to the EfS activities?
 - d) Do you feel that the students are developing an understanding of EfS as a result of this? How do you know?
- 3) How do you feel your sessions with the EFS Facilitator are going so far? Why?
- 4) What are your thoughts on the development of the whole school approach process to date? What has helped or inhibited it?
- 5) How useful do you find the school documentation relating to the whole school approach development in your teaching practice? Why or why not?

Appendix 7

Individual written questionnaire: Teachers

- 1) Now that we are at the end of the year, can you describe if/how your understanding of education for sustainability has changed over the year and why or why not?
- 2)
 - a) Can you summarise what (if any) EfS related activities you have taught or been involved in since July this year?
 - b) How would you describe your teaching approaches to EfS in these instances?
 - c) Now, at the end of the year, how do you think the students have responded to the whole school approach to EfS? Why?
 - d) Do you feel the students have changed in their understanding of the concept of sustainability over the year? Why or why not? How do you know?
 - e) How would you describe your own views (as a teacher), and your students views of their physical environment (at school in particular) with respect to education for sustainability? Do you feel they have changed over the year? Why or why not?
- 3) What are your thoughts on the process of a whole school approach (to EfS)?
Eg. factors that inhibit it, help it, positive and/or, negative aspects of it, practicalities of it etc...
- 4)
 - a) What have been your thoughts on the PD sessions with Beth this year?
E.g. positive points, negative points, suggestions for improvement etc.....
 - b) Ideally, what part do you think PD should play for you as a teacher in a school that is developing a whole school approach to EfS?
- 5) What are your comments (positive, negatives etc...) on school organisational structures (eg meetings, timetabling etc...) that have/have not occurred during the year with respect to the whole school approach to EfS?
- 6) What are your thoughts on if/how Ryelands has reflected a cultural/bicultural identity over the year?

Appendix 8

Formal interview schedule: EfS Facilitator

- 1) What plans do you have for the school in terms of sustainability?
- 2) What would you like to see happen at the school in terms of sustainability?
- 3) What are the positive (sustainable) aspects of the school that you feel they can enhance as part of their whole school approach to EfS? (how can they work with what they have?)
- 4) What do you feel are the sustainability issues that the school needs to work on? What potential barriers do you perceive?
- 5) How did you feel that session with the school went?
- 6) What is your impression of the commitment of this school to EfS and sustainability?
- 7) How does this compare to other schools you have worked with at their outset in EfS?

Appendix 9

Student focus group semi-structured interview questions

- 1) Think about what you have learnt about the environment from both your teacher and Mrs X. who visited recently. How you feel about the environment at this school?
- 2) Tell me about what you've been doing relating to EfS?
- 3) What can you tell me about the vision map that you've been working on?
- 4) Do you think it's important to look after your school environment – why or why not?
- 5) Whose job do you think it might be to look after the environment at your school? Why?
- 6) What do you think the word 'sustainability' means?

Appendix 10

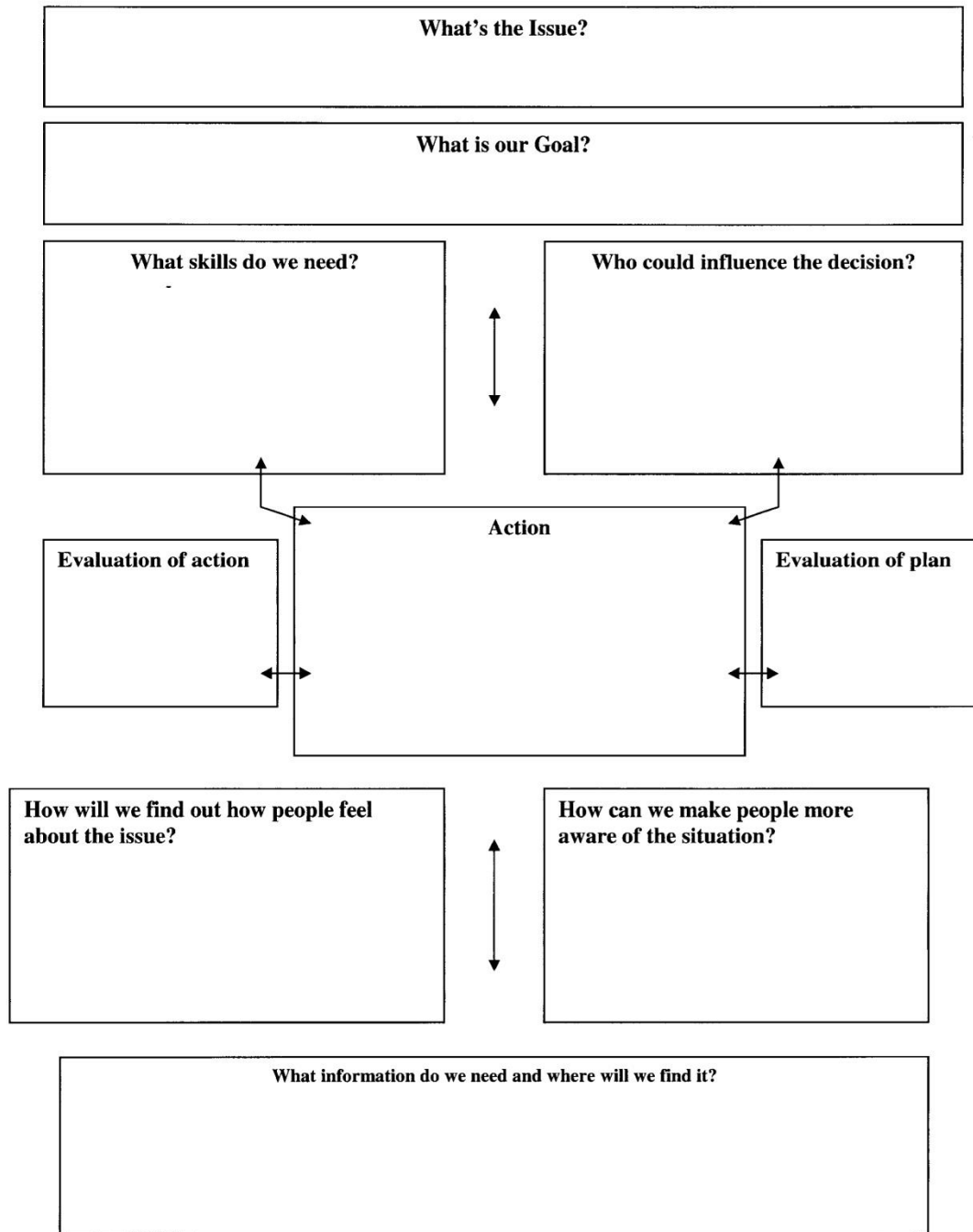
Staff focus group questions

- 1) Can you summarise what (if any) EfS related activities you have taught or been involved in this year (2010)?
- 2) How would you describe your teaching approaches to EfS in these instances?
- 3) How do you think the students have responded to the whole school approach to EfS? Why?
- 4) Do you feel the students have changed in their understanding of the concept of sustainability over the year? Why or why not? How do you know?
- 5) Do you feel that your understanding of the concept of sustainability has changed over the year? Why or why not?
- 6) What are your thoughts on the various factors that have been involved the whole school approach to EfS this year, ie those that help it or inhibit it, positive and/or, negative aspects of it, practicalities of it etc...
- 7) What have been your thoughts on the PD sessions, and/or lack thereof with Beth this year? E.g. positive points, negative points, suggestions for improvement etc..... How has this affected your development of a whole school approach to EfS this year (2010)?
- 8) Ideally, what part do you think PD should play for you as a teacher in a school that is developing a whole school approach to EfS?
- 9) What are your comments (positive, negatives etc...) on school organisational structures (eg meetings, timetabling etc...) that have/have not occurred during the year with respect to the whole school approach to EfS?

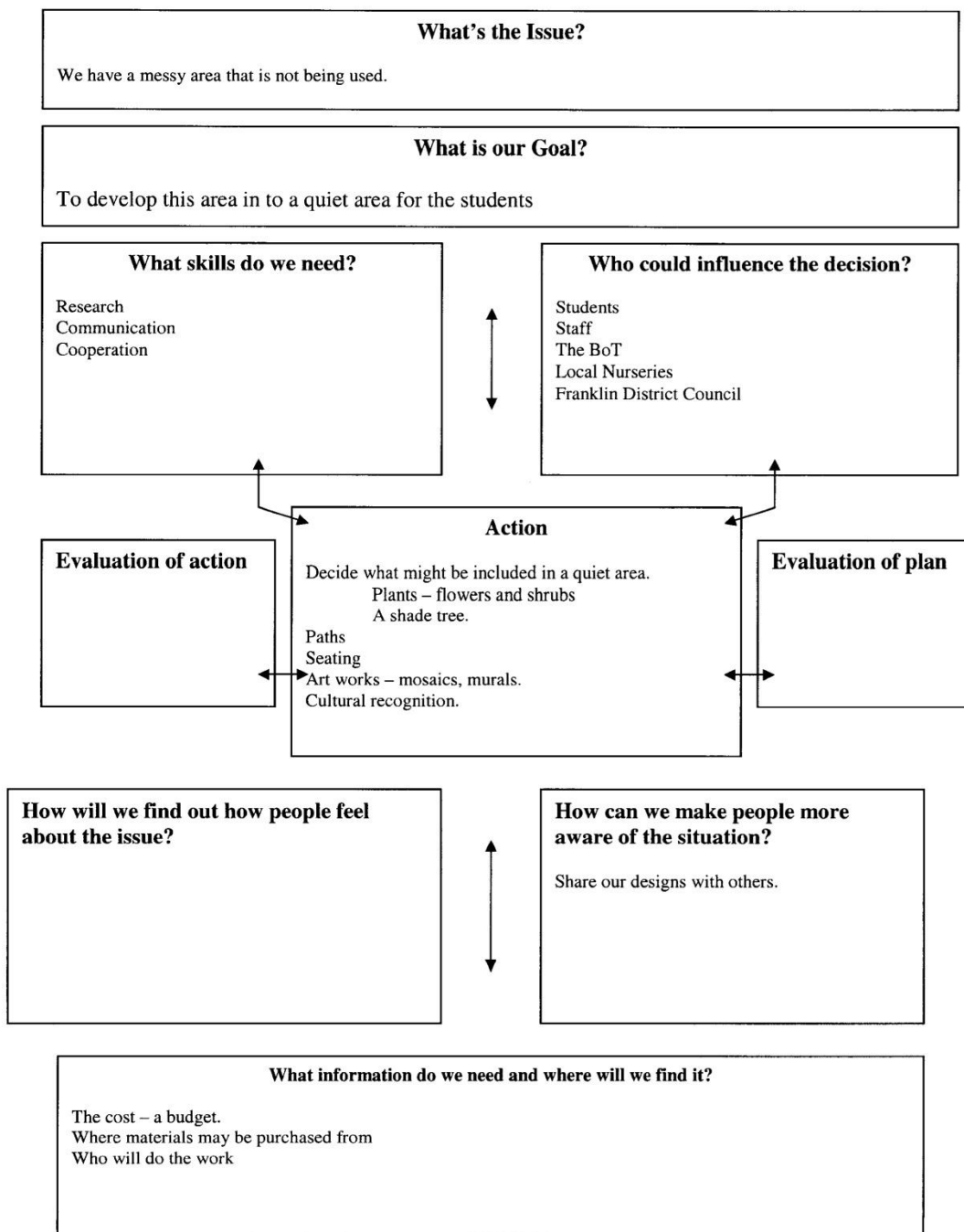
Appendix 11

Environmental action planners

Environmental Action Planner.



Environmental Action Planner.



Appendix 12

Summary of 'Ryelands matters' meeting

SUMMARY [REDACTED] Matters

Developing Home /School partnerships Feb 25 09

20 parents attended, no representation from Maori and Pacifica families-great feedback for format of evening

1. We are a **Health Promoting School**.

What health and well- being issues are important for your children?

- Playground supervision
- Finishing lunches
- Healthy food options-positive now
- Better drinking water-fountains/water bottles
- Be rubbish free
- Good social interaction

Do we meet the physical, emotional, social and spiritual needs of your children?

- Like rubbish home in lunchboxes-helps monitor eating
- "Brain food" snack working well
- Cool schools-great
- Want to continue
- Like PAL-teach games
- Like music availability during "school time"
- Like low key values based Bible in Schools
- Great rules and rewards that work for their children-explained "lion award"

What focus would you like us to take?

- Vision needs to be more visual
- Carpark an issue
- Cultural focus-respect and acknowledge all groups-cooking/weaving/songs

2. We are required to report to parents on their child's achievement at least twice a year-one of these times must be in writing.

Forms of reporting include-parent interviews/ 3 way triadic interviews, written reports with comments, sample folders, portfolios of work, informal meetings, parent information sessions, open days, children's personal reflections...

What is the most effective way we communicate achievement to you?

Verbal feedback

Triadic interviews-senior

Notebooks-

Portfolios-prompt questions for interviews

How could we report to you more effectively?

2-3 interview opportunities

Compare against national average and norms (AsTTLe)

Compare with previous results

Results to accompany reports-could use eTap

How often and what would you like us to report to you?

No strong views

3. Revisiting the "BIG PICTURE"

The NZC values are

- Excellence
- Innovation, inquiry and curiosity
- Diversity
- Equity
- Community and participation
- Ecological sustainability
- Integrity
- Respect

Which of these do you consider most important?

How could we develop them?

Are there other values you would like added?

Have we included them in our school vision?

Do we need to make any modifications?

2006/7 initial consultation with staff and community produced a vision and model around a child with a backpack. The parents present felt it would be timely to revisit this with the view to modifying the statements to align it with the finalised NZC document.

One suggestion was to simplify the vision by isolating the key words and surrounding the graphic with them.

4. Our physical environment –

What are the positives things about our environment?

- Caring school
- Recycling
- Large grounds-good mix of playing fields/hard areas/shelter
- New building improvements
- Pool
- Lots of fresh air-open flow
- Small class numbers
- Size of school-teachers know all the children
- Tidy school
- Good interaction between all groups

What changes would improve our physical environment?

- Parking/Speed
- Covered areas from juniors to office
- General maintenance
- Netball-courts resurfaced
- Caretaker
- Tidy up of gardens/school
- Shade over playground
- Library spruce up
- Dedicated music area
- Multipurpose area

How can you support us with these projects?

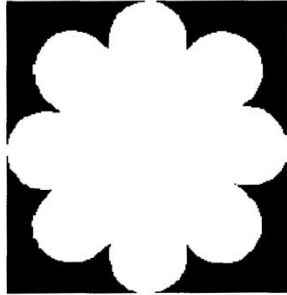
- Joan-keen gardener-native bush clean up and label
- Water supply-drinking fountains, watering gardens

SCHOOL ORGANISATION

- Timetables
- Special needs
- Special talents
- School events-EOTC/ at school
- BOT
- PTA
- Office times
- Cross Grouping

A question and answer opportunity.

3 staff members explained each of these areas and fielded questions.



Appendix 13

Ethics letters and consent forms - adult and student

Letter to staff

Dear (staff member name),

I am writing to ask your permission to include you in my PhD research study at Ryelands School. This study involves evaluating the development of a whole school approach to education for sustainability (EfS) and investigating the relationship between whole school approaches to education for sustainability and student learning. The project aims to gain an understanding of a whole school approach to EfS and what this might contribute to student learning, particularly in environmental education for sustainability. My hope is that findings from the project can help to enhance teaching and learning across the school, and particularly in environmental education/education for sustainability. The school principal has granted me permission to conduct the research in the school and I would like to involve you.

I will be researching in your school as the school's EfS advisor [Beth] guides the school on its EfS 'journey', under the direction of an experienced research mentor [John (pseudonym), University of Waikato] for one to two years. I expect to gather data primarily during the beginning and end of each school term (second and second to last week of term). I plan to talk to staff, individually and/or in small groups, about topics relating to the whole school approach to EfS in your school. I expect that any such talk/interview will last no more than one hour. I plan to minimize disruption to teaching by arranging for interviews to occur after school hours, or for paid teacher release days if a longer session will be required. Interviews will be audiotaped and transcribed. You may request a copy of your transcript if an individual interview is held with you. I may also ask you to complete a questionnaire which should take no longer than 45 minutes. As part of my data collection I may also like to look at some of your term planning documentation. With your permission, I may copy certain parts of these documents to enable analysis at a later date. Finally, I may also undertake meeting, classroom or school observations either independently of, or accompanying Beth on her school visits, and thus may like to take written notes, photographs or videos that may include you to show evidence of EfS activity. I would take all steps to ensure that the chances of identifying you are minimised by not including faces and other identifying features in the photos or videos. I would seek your permission for the use of any photo containing you in any

reporting or publication of this project. Any discussions with you, any notes taken during conversations, any audiotape or photographs taken, and documentation copied will be kept strictly confidential to myself, Beth, and my supervisor, John.

Data collected from you may be used in writing reports, publications or in presentations. I will not use your name or the name of the school in any publications or presentations, so your work and ideas will remain anonymous. I will make sure that we store all the information we gather securely. You can decline to be involved in the research, and can withdraw from individual involvement in the research at any time. This would mean that no further information will be gathered about your activities and ideas.

I would appreciate your permission to be involved with this research project. If you need any more details about the project please contact me by email, xxxxxx, or by mobile phone, xxxxxx.

In the event of any issues arising from the research also contact me. If I cannot clarify the issue please contact my supervisor, John at the University of Waikato (email: xxxxxx tel: xxxxxx).

If you give consent to be involved, please sign the attached consent form and return it to the school office for me in the envelope provided. Please retain this letter for your information.

Sincerely,

Tatiana Kalnins

Staff consent form

I have read the attached letter of information.

I understand that:

1. My participation in the project is voluntary.
2. I have the right to withdraw at anytime.
3. Data may be collected from me in the ways specified in the accompanying letter. This data will be kept confidential and securely stored.
4. Data obtained from me during the research project may be used in the writing of reports or published papers and making presentations about the project. This data will be reported without use of my name.

I give my consent to the following (tick boxes which apply):

- I can be involved in an individual or small group interview.
- I can be involved in completing a questionnaire
- I can be involved in classroom or school observations
- Copies of my teaching planning work can be collected for analysis. Examples from this work may be included in reporting but they will be used anonymously.
- Photos and/or videos of me, where I cannot be identified, can be used in the project reports, publications or presentations.

I can direct any questions to Tatiana Kalnins, email: xxxxxx, ph:xxxxxxx.

For any unresolved issues I can contact Project Director, John at the University of Waikato (email: xxxxxx ph: xxxxxx).

I give my consent to be involved in the project under the conditions set out above.

Name: _____

Signed: _____

Date: _____

Please return this form to me.

Letter to Caregivers

Dear Parent/Caregiver,

I am writing to ask your permission to include your child in my PhD research study at Ryelands School. This study involves evaluating the development of a whole school approach to education for sustainability (EfS) and investigating the relationship between whole school approaches to education for sustainability and student learning. The project aims to gain an understanding of a whole school approach to EfS and what this might contribute to student learning, particularly in environmental education for sustainability. My hope is that findings from the project can help to enhance teaching and learning across the school, and particularly in environmental education/education for sustainability. The school principal has granted me permission to conduct the research in the school and I would like to involve your child.

I will be researching at Mauku school as the school's EfS advisor (Beth) guides the school on its EfS 'journey', under the direction of an experienced research mentor John, (University of Waikato) for one to two years (2009-2010). During primarily the beginning and end of each school term I plan to gather data from students using one or more of the following data collection methods –

- Interviews
- Examination of student work,
- Questionnaire
- Classroom or school observations

I plan to talk to students either individually or in small groups, as they either walk around the school or in the classroom while they show me what they have been doing in EfS, hoping that this will stimulate useful discussion. I also plan to ask students to create concept maps and/or drawings during interviews to help encourage discussion. I expect that any such talk/interview will last no more than thirty minutes, and I will plan to minimise disruption to your child's learning in the school. Interviews will be audiotaped and transcribed. You may request a copy of your child's transcript if an individual interview is held with your child. I may also ask your child to complete a questionnaire which should take no longer than 30 minutes to complete. As part of my data collection I may also like to look at some of your child's school work. With your permission, and that of your child, I may copy certain parts of these documents to enable analysis at a later date. Finally, I may also undertake classroom or school observations (at times during the year that may or may not be at the beginning or end of the school term) and may take photographs or videos that may include your child to show evidence of

EfS activity. I would take all steps possible to ensure that the chances of identifying the school and your child are minimized by not including faces and other identifying features in the photos/videos. I would seek your permission for the use of any photo containing your child in any reporting or publication of this project. Any discussions with your child, any notes taken during conversations, any audiotape or photographs taken, and student work copied will be kept strictly confidential to myself, Beth and my research mentor, John.

Data collected from your child may be used in writing publications or in presentations. I will not use your child's name or the name of the school in any publications or presentations, so your child's work and ideas will remain anonymous. I will make sure that I store all the information I gather securely. Your child can decline to be involved in the research, and can withdraw from individual involvement in the research at any time. You can also decline your child's involvement and may also withdraw your child at any stage. This would mean that no further information will be gathered about your child's activities and ideas. If there is a withdrawal I will return any work gathered from your child where possible.

I would appreciate your permission for your child to be involved with this research project. If you need any more details about the project please contact me by email xxxxxx or phone xxxxxxxx.

In the event of any issues arising from the research also contact me. If I cannot clarify the issue please contact my PhD supervisor, John at the University of Waikato (email: xxxxxx tel: xxxxxx).

If you give consent for your child to be involved, please sign the attached consent form and ask your child to return it to the school office for me in the envelope provided. Please retain this letter for your information.

Sincerely,

Tatiana Kalnins

Research Consent Form - Parent/Caregiver

I have read the attached letter of information.

I understand that:

1. My child's participation in the project is voluntary.
2. I have the right to withdraw my child at anytime and my child has the right to withdraw at any time.
3. Data may be collected from my child in the ways specified in the accompanying letter. This data will be kept confidential and securely stored.
4. Data obtained from my child during the research project may be used in the writing of reports or published papers and making presentations about the project. This data will be reported without use of my child's name.

I give my consent to the following (tick boxes which apply):

- My child can be involved in an individual or small group interview.
- My child can be involved in completing a questionnaire
- My child can be involved in classroom or school observations
- Copies of my child's work can be collected for analysis. Examples from their work may be included in reporting but they will be used anonymously.
- Photos or videos of my child, where my child cannot be identified, can be used in the project reports, publications or presentations.

I can direct any questions to Tatiana Kalnins, email: xxxxxxxx, or ph: xxxxxxxx

For any unresolved issues I can contact the research supervisor, John at the University of Waikato (email: xxxxxxxxx ph: xxxxxxxxx).

I give consent for my child to be involved in the project under the conditions set out above.

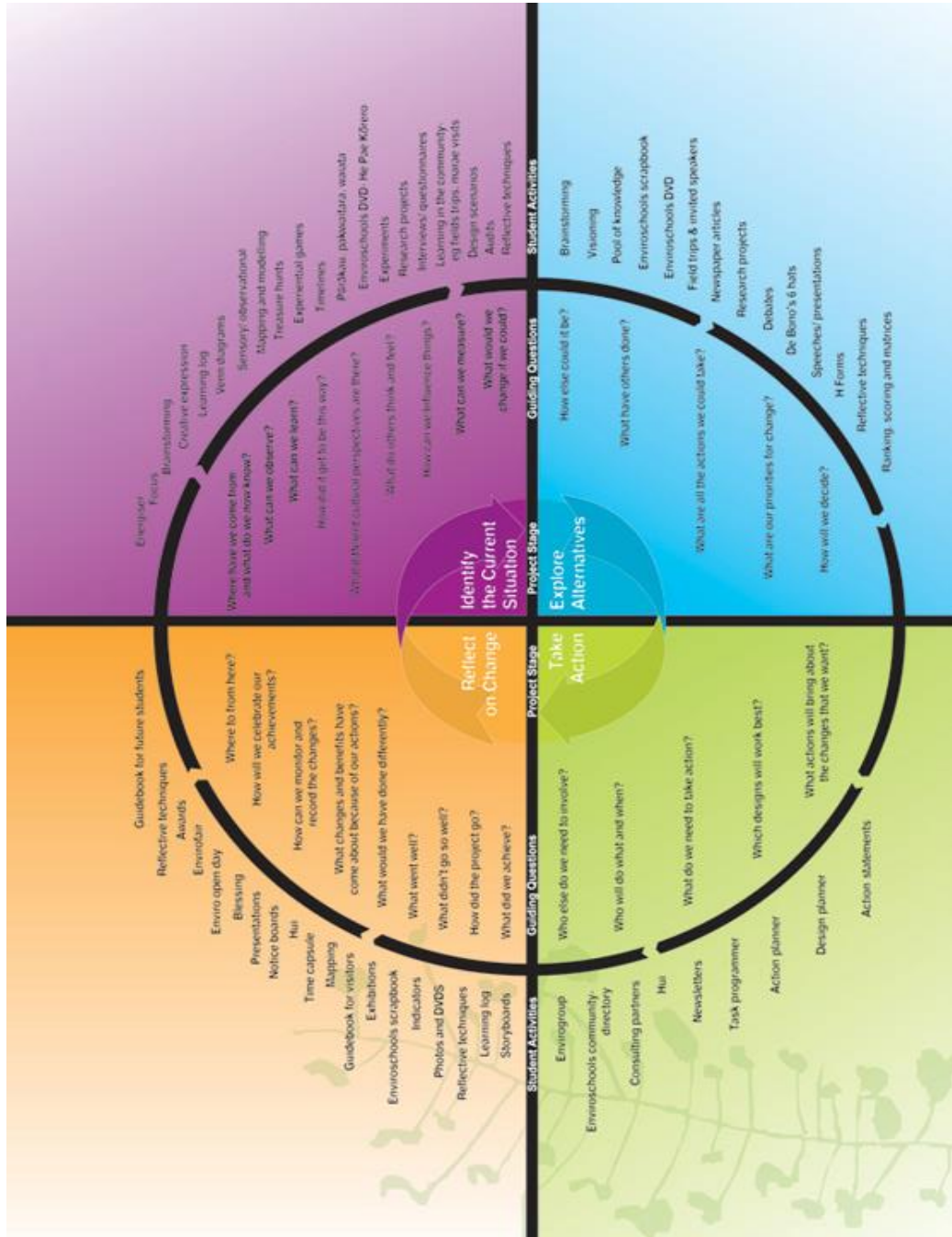
Names of parent and child: _____

Signed: _____ Date: _____

Please return this form to me via the school.

Appendix 14

Enviroschools action learning cycle



(www.enviroschools.org.nz)

Appendix 15

Teaching as inquiry

mean for an individual student and to sequence students' learning experiences over time.

Teaching as inquiry

Since any teaching strategy works differently in different contexts for different students, effective pedagogy requires that teachers inquire into the impact of their teaching on their students.

Inquiry into the teaching-learning relationship can be visualised as a cyclical process that goes on moment by moment (as teaching takes place), day by day, and over the longer term. In this process, the teacher asks:

- What is important (and therefore worth spending time on), given where my students are at?

This *focusing inquiry* establishes a baseline and a direction. The teacher uses all available information to determine what their students have already learned and what they need to learn next.

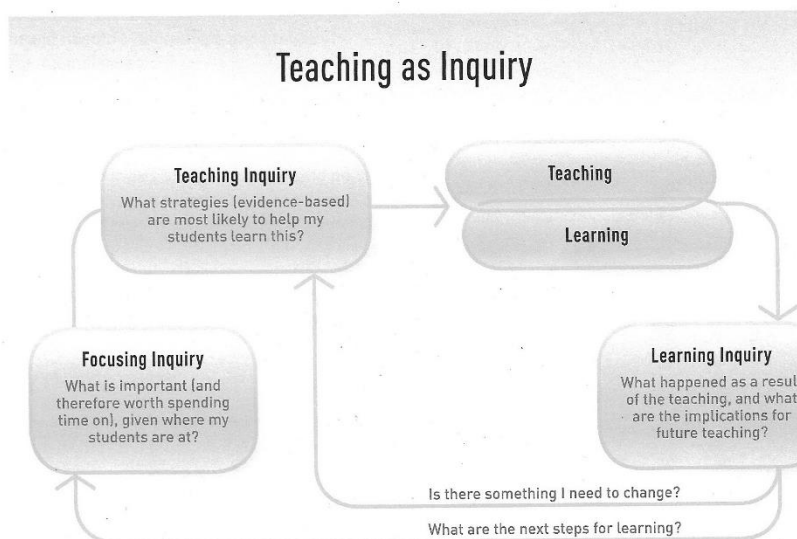
- What strategies (evidence-based) are most likely to help my students learn this?

In this *teaching inquiry*, the teacher uses evidence from research and from their own past practice and that of colleagues to plan teaching and learning opportunities aimed at achieving the outcomes prioritised in the focusing inquiry.

- What happened as a result of the teaching, and what are the implications for future teaching?

In this *learning inquiry*, the teacher investigates the success of the teaching in terms of the prioritised outcomes, using a range of assessment approaches. They do this both while learning activities are in progress and also as longer-term sequences or units of work come to an end. They then analyse and interpret the information to consider what they should do next.

See pages 39–40 for a discussion of purposeful assessment.



Appendix 16

Aspects of Whole School Approaches (Eames et al., 2013)

People

- 1) Working collaboratively across all groups involved in the school
- 2) Reflecting the cultural diversity of the school and its community
- 3) Acknowledging Aotearoa New Zealand's bicultural foundations
- 4) Having community relationships for learning
- 5) Engaging in participatory key decision making
- 6) Being involved in action for sustainability
- 7) Having support from school leaders for EfS in the school
- 8) Involving staff in professional development in EfS
- 9) Recognising the school as part of a local, national and global community in EfS
- 10) Celebrating whole-school achievements in EfS

Programmes

- 11) Having a whole-school plan for EfS
- 12) Developing coherence between learning areas and EfS delivery
- 13) Using effective pedagogies in EfS to develop students' action competence in sustainability
- 14) Facilitating learning experiences in EfS within and outside the classroom in a variety of settings
- 15) Fostering co-curricular opportunities in EfS

Practices

- 16) Carrying out assessment that recognises student development of action competence in sustainability

- 17) Utilising budgeting and purchasing procedures based on sustainability principles
- 18) Having organisational support structures available for EfS 19 Practising sustainable resource management
- 20) Ensuring school practices reinforce EfS wholeschool programme and goals

Place

- 21) Orienting new staff and students to sustainability in the school 22 Monitoring, evaluating and reflecting
- 23) Using a variety of natural environments in the school grounds for formal and informal learning
- 24) Having a variety of natural environments in the school grounds that sustain people and ecosystems
- 25) Developing new and existing school buildings that benefit the environment and student learning

References

- Alerby, E. (2000). A way of visualising children's and young people's thoughts about the environment: A study of drawings. *Environmental Education Research*, 6(3), 205-222. [http://doi.org/ 10.1080/13504620050076713](http://doi.org/10.1080/13504620050076713)
- Arlemalm-Hagser, E., & Davis, J. (2014). Examining the rhetoric : a comparison of how sustainability and young children's participation and agency are framed in Australian and Swedish early childhood education curricula. *Contemporary Issues in Early Childhood*, 15(3), 231-244. [http://doi.org/ 10.2304/ciec.2014.15.3.231](http://doi.org/10.2304/ciec.2014.15.3.231)
- Agyeman, J. (2006). Action, experience, behaviour and technology - why it's just not the same? *Environmental Education Research*, 12(3-4), 513-522. <http://doi.org/10.1080/13504620600799281>
- Argyle, M. (1978). Discussion chapter: An appraisal of the new approach to the study of social behaviour. In M.Brenner, P. Marsh and M.Brenner (Eds) *The Social Contexts of Method*. London: Croom-Helm, 237-255.
- Archer, M. (1989). *Culture and agency*, Cambridge University Press - Cambridge.
- Arnold, C. (2007). Empowerment, learning and schools: Reflections from psychology. *Education Review*, 20(1), 108-113.
- Banathy, B. (1991). Comprehensive systems design in education: Who should be the designers? *Educational Technology*, 31(9), 49-51.
- Ballantyne, R., Fien, J., & Packer, J. (2001). School environmental education programme impacts upon student and family learning: A case study analysis. *Environmental Education Research*, 7(1), 23-37. <http://doi.org/10.1080/13504620124123>
- Ballantyne, R., & Packer, J. (2005). Promoting environmentally sustainable attitudes and behaviour through free-choice learning experiences: what is the state of the game? *Environmental Education Research*, 11(3), 281-295. <http://doi.org/10.1080/13504620500081145>
- Barker, M., & Rogers, L. (2004). In, about, for: Exploring the foundations of environmental education. *set: Research Information for Teachers*, 2, 15-18.
- Barrett, M. (2006). Education for the environment: action competence, becoming and story. *Environmental Education Research*, 12(3-4), 503-511. <http://doi.org/10.1080/13504620600799273>

- Barratt-Hacking, E., Barratt, R., & Scott, W. (2007). Engaging children: research issues around participation and environmental learning. *Environmental Education Research*, 4(13) 529-544. <http://doi.org/10.1080/13504620701600271>
- Bernstein, B. (1974). *Class, codes, and control: Theoretical studies towards a sociology of language*. London: Routledge & Kegan Paul.
- Bell, B. (2005). *Learning in science: The Waikato research*. RoutledgeFalmer: Canada.
- Birdsall, S. (2010). Empowering students to act: Learning about, through and from the nature of action. *Australian Journal of Environmental Education*, 26, 65-84. <http://doi.org/10.1017/S0814062600000835>
- Bolstad, R., Cowie, B. & Eames, C. (2003). Environmental education in New Zealand schools: Research into current practice and future possibilities. Wellington: Ministry of Education.
- Bolstad, R. (2003). Environmental education: Roots in the past, visions of the future, opportunities in the present. *set: Research Information for Teachers*, 2, 10-13.
- Bolstad, R., Joyce, C. & Hipkins, R. (2015). Environmental education in New Zealand schools: Research update 2015. Wellington: Ministry of Education.
- Borko, H. & Putnam, R. (1995). Expanding a teacher's knowledge base: a cognitive psychological perspective on professional development. In T. Guskey, & M. Huberman (Eds.), *Professional development in education: new paradigms and practices*. New York: Teachers College Press.35-65.
- Buchanan, J., Schuck, S., & Aubusson, P. (2013). Efficacy, agency and behavioural change: Evaluation of a local/global sustainability education program. *The Social Educator*, 30(3), 11-18. <http://doi.org/10.1017/aee.2015.55>
- Byrne-Jimenez, M. & Orr, M. (2012). Thinking in three dimensions. Leadership for capacity building, sustainability, and succession. *Journal of Cases in Educational Leadership*. 15(3), 33-46. <http://doi.org/10.1177/1555458912447842>
- Brundtland, G. H. (1987). *Report of the World Commission on environment and development: "our common future."*. United Nations.
- Carr, K. (2016). Leading sustainability in schools. *Management in Education*, 30(3), 126-130. <http://doi.org/10.1177/0892020616653177>

- Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education (7th ed.)*. London & New York: RoutledgeFalmer, Taylor & Francis Group.
- Coll, R. K., Pinyonattagarn, D., & Pramoolsook, I. (2003). The internationalization of cooperative education: A Thailand perspective. *Asia-Pacific Journal of Cooperative Education*, 4(2), 1-6.
- Cowie, B., & Eames, C. (2004). Environmental education in New Zealand schools: Challenges for sustainability. *Research Information for Teachers*, 3, 19-23.
- Cranton, P. (1994). *Understanding and promoting transformative learning - a guide for educators of adults*. San Francisco, Jossey-Bass
- Cranton, P. (2006). Fostering authentic relationships in the transformative classroom. *New Directions for Adult and Continuing Education*, 109, 5-13. <http://doi.org/10.1002/ace.203>
- Creswell, J. (2009). *Research design: qualitative, quantitative and mixed methods approaches*. (3rd ed.). Sage Publications.
- Creswell, J. (2014). *Research design: qualitative, quantitative and mixed methods approaches*. 4th Ed. Sage Publications.
- Creswell, J. W. (2012). Collecting qualitative data. *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Fourth ed. Boston: Pearson, 204-35.
- Chawla, L. (2009). Growing up green: Becoming an agent of care for the natural world. *The Journal of Developmental Processes*, 4(1), 6-23.
- Cheng, C., & Woolman, S. (2000). *One Child*. New York: Crocodile books.
- Davis, J., & Cooke, S. (2007). Educating for a healthy, sustainable world: An argument for integrating health promoting schools and sustainable schools. *Health Promotion International* 22(1), 346-353. <http://doi.org/10.1093/heapro/dam030>
- Denzin, N. & Lincoln, Y. (2003) (Eds.) *Collecting and Interpreting Qualitative Materials*. Thousand Oaks. Sage: London.
- Donmoyer, R. (2006). Take my paradigm... please! The legacy of Kuhn's construct in educational research. *International Journal of Qualitative Studies in Education*, 19(1), 11-34. <http://doi.org/10.1080/09518390500450177>
- Dixon-Woods, M., Shaw, R. L., Agarwal, S., & Smith, J. A. (2004). The problem of appraising qualitative research. *Quality and Safety in Health Care*, 13(3), 223-225. <http://doi.org/10.1136/qshc.2003.008714>

- Duffy, F. (2006). The process of systemic change. Step up to excellence: A protocol for navigating whole system change in school districts. *TechTrends*, 50(2), 41. <http://doi.org/10.1007/s11528-006-7585-y>
- Dumbleton, P. (1990). A philosophy of education for all? *British Journal of Special Education*, 17(1), 16-18. <http://doi.org/10.1111/j.1467-8578.1990.tb00335.x>
- Eames, C., Law, B., Barker, M., Iles, H., McKenzie, J., Patterson, R., Williams, P., Wilson-Hill, F., Carrol, C., Chaytor, M., Mills, T., Rolleston, N. & Wright, A. (2006). Investigating teachers' pedagogical approaches in environmental education that promote student action competence. *Teaching and Learning Research Initiative*, Wellington, New Zealand. (Downloaded: Feb 20 2018, http://tlri.org.nz/pdfs/9224_finalreport.pdf)
- Eames, C., Bolstad, R. , & Cowie, B. (2004). An evaluation of the practice of environmental education in New Zealand schools. Paper presented at the American Educational Research Association (AERA) conference, San Diego.
- Eames, C., & Cowie, B. (2004). Environmental education in New Zealand schools: Characteristics and achievements. *set: Research Information for Teachers*, 2: 19-24.
- 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. <http://doi.org/10.1080/13504620701843343>
- Eames, C., Wilson-Hill, F., & Barker, M. (2013). Exploring whole-school approaches to education for sustainability. *set: Research Information for Teachers*, 1, 12-19.
- Education counts (2015). Retrieved from www.educationcounts.govt.nz/find-school/school/population/.
- Eisner, E. W. (1993). Forms of understanding and the future of educational research. *Educational researcher*, 22(7), 5-11. <http://doi.org/10.3102/0013189X022007005>
- Erturk-Kara, G., Aydos, H., & Aydin, O. (2015). Changing preschool children's attitudes into behaviour towards selected environmental issues: an action research study. *International Journal of Education in Mathematics, Science and Technology*, 1(3), 45-63.
- Enviroschools. (2016). Retrieved January 2016 from www.enviroschools.org.nz
- Enviroschools. (2014). Retrieved March 2016 from www.enviroschools.org.nz

- Fien, J. (1995). Teaching for a sustainable world: The environmental and development education project for teacher education. *Environmental Education Research*, 1(1): 21-34. <http://doi/10.1080/1350462950010102>
- Forlin, C. (2007). Inclusive educational practices. *Chinese Education and Society*, 40(4): 63-75. <http://doi.org/abs/10.2753/CED1061-1932400405>
- Frey, N. & Pumpian, I. (2006). The art of collaboration: Principles of design. *Principal Leadership*, 7(3), 16-20.
- Freire, P. (1972). *Pedagogy of the oppressed*. New York: Herder & Herder.
- Fullan, M. (2001). *Leading in a culture of change*. San Francisco: Jossey-Bass.
- Fullan, M. (2005). *Leadership & sustainability: system thinkers in action*. Corwin Press: Thousand Oaks: California.
- Gambino, A., Davis, J., & Rowntree, N. (2009). Young children learning for the environment: Researching a forest adventure. *Australian Journal of Environmental Education*, 25, 83-94. <http://doi.org/10.1017/S0814062600000422>
- Gough, A. (1997). Education and the Environment. Policy, trends and the problem of marginalisation. Melbourne: Australian Council for Educational Research., 204 pages, *Australian Journal of Teacher Education*. <http://dx.doi.org/10.14221/ajte.1998v23n1.7>
- Gruenewald, D. (2003). Foundations of place - a multidisciplinary framework for place-conscious education. *American Educational Research Journal*, 40(3): 619-654. <http://doi.org/10.3102/00028312040003619>
- Green, M. & Somerville, M. (2015). Sustainability education: researching practice in primary schools. *Environmental Education Research*, 21(6), 832-845. <http://doi.org/10.1080/13504622.2014.923382>
- Guba, E. G. (1989). Fourth generation evaluation. *New Bury Park: CA: Sage*.
- Guskey, T. (2014). Planning professional learning. *Educational Leadership*, May, 11-16.
- Hamilton City Council. (2001). *Enviroschools handbook*.
- Hargreaves, A. & Fink, D. (2004). The seven principles of sustainable leadership *Educational Leadership*, 61(7), 8-13.
- Harrison, L. (2007). From authoritarian to restorative schools. *Reclaiming children and youth* 16(2), 17-20.

- Hart, R. (1997). *Children's participation: The theory and practices of involving young citizens in community development and environment and environmental care*. UNICEF: New York. Earthscan Publications Ltd.
- Haight, W., Kayama, M., & Korang-Okrah, R. (2014). Ethnography in social work practice and policy. *Qualitative Social Work, 13*(1), 127-143. <http://doi.org/10.1177/1473325013507303>
- Henderson, K., & Tilbury, D. (2004). Whole-school approaches to sustainability: An international review of sustainable school programs. *Report Prepared by the Australian Research Institute in Education for Sustainability (ARIES) for The Department of the Environment and Heritage, Australian Government. ISBN, 1(86408), 979.*
- Higgs, A. & McMillan, V. (2006). Teaching through modeling: four schools' experiences in sustainability education. *The Journal of Environmental Education, 38*(1), 39-53. <http://doi.org/10.3200/JOEE.38.1.39-53>
- Holdsworth, S., Wyborn, C., Bekessy, S., & Thomas, I. (2008). Professional development for education for sustainability. *International Journal of Sustainability in Higher Education, 9*(2), 131-146. <http://doi.org/10.1108/14676370810856288>
- Huckle, J., & Sterling, S., (Ed). (1996). *Education for sustainability*, Earthscan: London.
- Huckle, J., (Ed). (1996). *Realizing sustainability in changing times*. Education for sustainability. Earthscan:London.
- IUCN/UNEP/WWF (1980). *World Conservation Strategy: Living resources for sustainable development* . Nevada: IUCN/UNEP/WWF.
- Jensen, B., & Schnack, K. (1997). The action competence approach in environmental education. *Environmental Education Research, 3*(2), 163-178. <http://doi.org/10.1080/1350462970030205>
- Jensen, B. (2002). Knowledge, action and pro-environmental behaviour. *Environmental Education Research, 8*(3), 325–334. <http://doi.org/10.1080/13504620220145474>
- Jickling, B., & Spork, H. (1998). Education for the environment: A critique. *Environmental Education Research, 4*(3), 309-327. <http://doi.org/10.1080/1350462980040306>
- Johnson, R., & Onwuegbuzie, A. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher, 33*(7), 14-26. <http://doi.org/10.3102/0013189X033007014>

- Johnson-Bailey, J., & Alfred, M. (2006). Transformational teaching and practices of black women adult educators. *New Directions for Adult and Continuing Education*, 109, 49-59. <http://doi.org/10.1002/ace.207>
- Kath Murdoch. (2018). Retrieved from www.kathmurdoch.com.au.
- Knapp, D., & Poff, R. (2001). A qualitative analysis of the immediate and short-term impact of an environmental interpretive program. *Environmental Education Research*, 7(1), 55-65. <http://doi.org/10.1080/13504620124393>
- Lather, P. (1992). Critical frames in educational research: Feminist and post-structural perspectives. *Theory into practice*, 31(2), 87-99. <http://doi.org/10.1080/00405849209543529>
- LeCompte, M., & Preissle, J. (2000). with Tesch, R. (1993). *Ethnography and qualitative design in educational research*. Orlando, Florida: Academic Press.
- Leung, L. (2015). Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care*, 4(3), 324-327. <http://doi.org/10.4103%2F2249-4863.161306>
- Liamputtong, P., & Ezzy, D. (2005). *Qualitative research methods* (2nd ed.). South Melbourne, VIC:Oxford University Press.
- Lincoln, Y., Lynham, S., & Guba, E. (2011). Paradigmatic controversies, contradictions, and emerging confluences, revisited. *The Sage handbook of qualitative research*, 4, 97-128.
- Lynagh, M., Schofield, M. & Sanson-Fisher, R. (1997). School health promotion programmes over the past decade: A review of the smoking, alcohol and solar protection literature. *Health Promotion International*, 12(1), 43-60. <http://doi.org/10.1093/heapro/12.1.43>
- Many, J., Howard, F., & Hoge, P. (2002). Epistemology and preservice teacher education: how do beliefs about knowledge affect our students' experiences? *English Education*, 34(4), 302-322.
- Merriam, S. (2009). *Qualitative research: A guide to design and implementation: Revised and expanded from qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- McClam, S., & Fores-Scott, E. (2012). Transdisciplinary teaching and research: what is possible in higher education? *Teaching in higher education*, 17(3), 231-243. <http://doi.org/10.1080/13562517.2011.611866>
- McKeown, R., & Hopkins, C. (2007). Moving beyond the EE and ESD disciplinary debate in formal education. *Journal of Education for Sustainable Development*, 1(1), 17-26. <http://doi.org/10.1177/097340820700100107>

- Merriam, S. (2004). The role of cognitive development in Mezirow's transformational learning theory. *Adult Education Quarterly*, 55(1), 60-68. <http://doi.org/10.1177/0741713604268891>
- Merriam, S. & Ntseane, G. (2008). Transformational learning in Botswana - how culture shapes the process. *Adult Education Quarterly*, 58(3), 183-197. <http://doi.org/10.1177/0741713608314087>
- Mezirow, J. (1990). How critical reflection triggers transformative learning. *Fostering critical reflection in adulthood*, 1, 20.
- McLean, T. (2003). Environmental education in Otago primary schools - Education for the environment? *set: Research Information for Teachers*, 1 4-9.
- Miles, M., & Huberman, A. (1994). *Qualitative data analysis*, Thousand Oaks, CA: Sage.
- Ministry of Education. (1999). *Guidelines for Environmental Education in New Zealand Schools*. Wellington: Learning Media.
- Ministry of Education. (2007). *The New Zealand Curriculum for English-medium teaching and learning in years 1-13*. Wellington: Learning Media.
- Ministry of Education. (2008). *Statement of intent 2008-2013*. Wellington: New Zealand: Ministry of Education.
- Ministry of Education. (2017). *Education for sustainability teaching and learning guide*. Retrieved from <https://seniorsecondary.tki.org.nz/Social-sciences/Education-for-sustainability>.
- Mogensen, F. & Schnack, K. (2010). The action competence approach and the 'new' discourses of education for sustainable development, competence and quality criteria. *Environmental Education Research*, 16(1), 59 – 74. <http://doi.org/10.1080/13504620903504032>
- Nazzari, V. & McAdams, R. (2005). Using transformative learning as a model for human rights education - a case study of the Canadian Human Rights Foundation's International human rights training program. *Intercultural Journal*, 16(2), 171-186.
- Onweugbuzie, A. (2000). Expanding the Framework of Internal and External Validity in Quantitative Research. Paper presented at the Annual Meeting of the Association for the Advancement of Educational Research (AAER) (Ponte Vedra, FL, November 2000). Retrieved from <https://files.eric.ed.gov/fulltext/ED448205.pdf>.

- Onwuegbuzie, A., & Leech, N. (2005). On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *International Journal of Social Research Methodology*, 8(5), 375-387. <http://doi.org/10.1080/13645570500402447>
- Oppenheim, A. (1992). *Questionnaire design and attitude management: Interviewing and Attitude Measurement*. London: Pinter.
- Parliamentary Commissioner for the Environment. (2004). *See change: Learning and education for sustainability*. Wellington: Parliamentary Commissioner for the Environment.
- Pepper, C. & Wildy, H. (2008). Leading for sustainability: is surface understanding enough? *Journal of Educational Administration*, 46(5), 613-629. <http://doi.org/10.1108/09578230810895528>
- Posch, P. (1999). The ecologisation of schools and its implications for educational policy. *Cambridge Journal of Education*, 29(3), 341-348. <http://doi.org/10.1080/0305764990290304>
- Pow, T. & Ingpen, R. (2001). *Who is the world for?* London: Walker Books Ltd.
- Prain, V., & Hand, B. (2003). Using new technologies for learning: A case study of a whole-school approach. *Journal of Research on Technology Education*, 35(4), 441-458. <http://doi.org/10.1080/15391523.2003.10782395>
- Priestly, M., & Sime, D. (2005). Formative assessment for all: A whole school approach to pedagogic change. *The Curriculum Journal*, 16(4), 475-492. <http://doi.org/10.1080/09585170500384586>
- Redman, E. (2013). Advancing educational pedagogy for sustainability: developing and implementing programs to transform behaviours. *International Journal of Environmental and Science Education*, 8(1), 1-34.
- Reigeleuth, C. (2006). A leveraged emergent approach to systemic transformation. *TechTrends* 50(2): 46-47.
- Rickinson, M., Hall, M., & Reid, A. (2016). Sustainable schools programmes: what influence on schools and how do we know? *Environmental Education Research*. 22(3) 350-389. <http://doi.org/10.1080/13504622.2015.1077505>.
- Thousand, J., Diaz-Greenberg, R., Nevin, A., Cardelle-Elawar, M., Beckett, C., Reese, R. (1999). Perspectives on a Freirean Dialectic to Promote Inclusive Education. *Remedial and Special Education*, 20(6), 323 – 326. <http://doi.org/10.1177/074193259902000602?>

- Shallcross, T., Loubser, C., le Roux, C., O'Donoghue, R., Lupele, J. (2006). Promoting sustainable development through whole school approaches: An international, intercultural teacher education research and development project. *Journal of Education for Teaching*, 32(3), 283-301. <http://doi.org/10.1080/02607470600782427>
- Share, J. (2007). Transformative media education. *Paulo Freire Institute Online Journal*, 2(1).
- Sipos, Y., Battisti, B., & Grimm, K. (2008). Achieving transformative sustainability learning engaging head, hands and heart. *International Journal of Sustainability in Higher Education* 9(1), 68-86. <http://doi.org/10.1108/14676370810842193>
- Simovska, V., & Prosch, A. (2016). Global social issues in the curriculum: Perspectives of school principals. *Journal of Curriculum Studies*, 48(5), 630-649. <http://doi.org/10.1080/00220272.2015.1114150>
- Silverman, D. (1993). *Interpreting qualitative data: Strategies for analyzing talk, text and interaction*. London: Sage.
- Stake, R. (2003). Case studies. In: N. L. Denzin & Y Lincoln, (Eds) *Strategies of qualitative inquiry* (2nd ed., pp 134-164), Thousand Oaks, CA- Sage.
- Sterling, S. (2001). *Sustainable Education: Re-Visioning Learning and Change. Schumacher Briefings*. Schumacher UK, CREATE Environment Centre, Seaton Road, Bristol, BS1 6XN, England (6 pounds).
- Sterling, S. (2010). *Sustainability education: Perspectives and practice across higher education*. Earthscan: London.
- Sterling, S., & Huckle, J. (2014). *Education for sustainability*. Earthscan: London.
- Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education in the 1990s. *Environmental Education Research*, 1(2), 195-212. <http://doi.org/10.1080/1350462950010206>
- Tilbury, D. (2004). Rising to the challenge: Education for sustainability in Australia. *Australian Journal of Environmental Education*, 20(2), 103-114. <http://doi.org/10.1017/S081406260000224X>
- Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2008). *Teacher Professional Learning and Development: Best Evidence Synthesis Iteration (BES)*. Educational Practices Series 18. International Bureau of Education. Downloaded from http://edu.aru.ac.th/childeddu/images/PDF/benjamaporn/EdPractices_18.pdf
- Torrance, D. (2013). Distributed leadership: challenging five generally held assumptions. *School Leadership and Management*. 33(4), 354-372. <http://doi.org/10.1080/13632434.2013.813463>

- UNCED (1992). *Promoting education, public awareness and training*. Chapter 36, Agenda 21., London: Regency Press.
- UNESCO-UNEP. (1977). Final Report:Tbilisi. UNESCO,14-26 Oct 1977. DOC:UNESCO/UNEP/MP/U9 (Paris UNESCO)
- UNESCO (2002). *Education for sustainability – from Rio to Johannesburg: Lessons learnt from a decade of commitment.*, Paris: UNESCO Education Sector.
- Uzzell, D. (1999). Education for environmental action in the community: new roles and relationships. *Cambridge Journal of Education*. 29(3), 397-413. <http://doi.org/10.1080/0305764990290309>.
- Wals, A., Geerling-Eijff, F., Hubeek, F., van der Kroon, S., & Vader, J. (2008). All mixed up? Instrumental and emancipatory learning toward a more sustainable world: Considerations for EE policymakers. *Applied Environmental Education and Communication*, 7(3), 55-65. <http://doi.org/10.1080/15330150802473027>
- Wals, A. & Jickling, B. (2002). “Sustainability” in higher education: from doublethink and newspeak to critical thinking and meaningful learning. *International Journal of Sustainability in Higher Education*. 3(3), 221-232. <http://doi.org/10.1108/14676370210434688>.
- Wooltorton, S. (2004). Local sustainability at school: A political reorientation. *Local Environment*, 9(6), 595-609. <http://doi.org/10.1080/1354983042000288085>
- Wyn, J., Cahill, H., Holdsworth, R., Rowling, L., & Carson, S. (2000). MindMatters, a whole-school approach promoting mental health and wellbeing. *Australian & New Zealand Journal of Psychiatry*, 34(4), 594-601.